

Development of a Pop-Up Book Learning Media Based on Local Wisdom for Grade V Students on IPAS Chapter 8: "Bumiku Sayang, Bumiku Malang, Bumi Berubah" at SD Negeri, Sarang, Rembang

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Abstract: Students' low interest in learning is often caused by teachers' lack of attention to interesting learning tools, which has an impact on students' interest in participating in the learning process. This research aims to develop and test the effectiveness of Pop Up Book learning media based on Rembang local wisdom for class V elementary school on the material Bumiku Sayang, Bumiku Malang Topic A Earth Changes. The research method used is Research and Development (R&D) based on the Borg & Gall model up to the seventh stage, which includes data collection, media design, validation, revision and effectiveness testing. Data was collected through observation, interviews, questionnaires and tests, then analyzed using the N-Gain Test and t-Test. The location of this research was at Gunungmulyo State Elementary School, Nglojo State Elementary School, Pelang State Elementary School, Sumbermulyo, Kalipang 1 Elementary School, Sarang District, Rembang Regency. The results of the N-Gain analysis show that the experimental class obtained a score of 0.7092 (high category), while the control class only obtained a score of 0.2039 (low category), indicating that the use of Pop Up media based on local wisdom can improve student learning outcomes significantly. The results of the Paired Sample t-Test show a significant difference between the pre-test and post-test results in the experimental class ($t_{count} = 43.918 > t_{table} = 2.0227$; Sig. = 0.000 < 0.05), indicating an increase in learning outcomes after using Pop Up media. Apart from that, the Independent Sample t-Test showed a significant difference between the learning outcomes of experimental class and control class students ($t_{count} = 14,216 > t_{table} = 1.993$; Sig. = 0.000 < 0.05). Thus, it can be concluded that Pop Up media based on Rembang local wisdom is effective and suitable for use in improving the learning outcomes of fifth grade elementary school students.

Keywords: Pop Up Book Media, Local Wisdom, Learning Results

1. Introduction

At this time, education in Indonesia experienced curriculum renewal, namely the independent curriculum. Because this curriculum is new, there are still many teachers who do not know the concept of the curriculum. Therefore, the government has carried out a lot of training related to the independent curriculum for all teachers in Indonesia. Because the independent curriculum is a learning forum that focuses on students' interests and talents, in a fun and pressure-free atmosphere. The independent curriculum has begun to be implemented in some schools, the implementation of the independent curriculum has experienced a few obstacles due to the lack of teacher creativity in implementing the independent curriculum for classroom learning. This independent curriculum is centered on freedom and creative thinking. According to (Ainia, 2020) "Teachers as the main subject whose role is expected to be able to act as a driving force to take action that provides positive things to students." Likewise, as stated by Nadiem Makarim as Minister of Education of the Republic of Indonesia, "Education reform cannot be carried out solely using an administrative approach, but must carry out culture transformation" Therefore, it can be concluded that the goal of the independent curriculum is to produce outstanding graduates with character traits aligned with the Pancasila-based student profile. Character development aligned with Pancasila can be achieved through local wisdom-based learning. The development of effective

learning media will be tailored to the learning material, the surrounding environment, the culture, and the students' psychological backgrounds. Therefore, before creating learning media, teachers will first analyze student abilities, assess the availability of materials at the school and its surroundings, and plan the classroom learning process. This will ensure that the learning material is effectively conveyed to students.

Local wisdom is applied in independent curriculum learning as an effort to realize the character of the Pancasila student profile, namely 2 Global Diversity. Global Diversity according to (Handayani et al. 2022) means "students are expected to be able to maintain and preserve local culture so that it is not displaced by foreign culture, and can filter foreign culture that is good and useful in developing their capacity as a student". Therefore, learning based on local wisdom is very important to apply in the learning process, considering that many foreign cultures have entered the country due to the rapid growth of technology so there are concerns that it will change local culture. When teaching, teachers should be able to relate local wisdom to the subject matter so that they can improve students' ability to think critically, apply important local cultural values, and students can learn about cultural diversity in the surrounding area. So that it can create student characters in accordance with the Pancasila student profile. The introduction of local wisdom in learning can be done through subjects. One of the subjects in elementary school that contains local wisdom material is the Social Sciences (IPS) subject.

Social Sciences subjects at the elementary school level, which previously stood alone, will now be taught together with natural science subjects in the new paradigm curriculum, so the name of these subjects has been changed to Social Natural Sciences (IPAS). Combining science and social studies subjects in elementary schools is in accordance with the decision of the head of BKSAP number 008/H/KR/2022 concerning learning outcomes for science and science subjects. Combining science and social studies subjects aims to enable students to manage the natural and social environment in one unit. Natural and Social Sciences (IPAS) according to BKSAP number 008/H/KR/2022 in Sunendar, (2022) explains that, "Natural and Social Sciences (IPAS) is a science that studies the life of the universe and inanimate substances and their interactions with the surrounding environment, as well as human life as individuals and social creatures who interact with their environment." So it can be concluded that 3 sciences are subjects that study living things and their relationship with the social environment. Therefore, the development of learning media is important to achieve the goals and success of learning activities, because teaching and learning activities are an effort to create an atmosphere that encourages initiative and provides motivation and fosters a sense of responsibility in students to apply the potential that exists within them in the learning process. Teachers play a very important role in developing learning media because developing learning media requires high creativity so that good learning media can be created. From the results of a preliminary study conducted at Gunungmulyo State Elementary School by conducting observations and distributing questionnaires regarding the needs of teachers and students, the results of the observations show that the learning media in schools still use integrated science and science textbooks as usual. This can be seen from the availability of books in the library. The media used is varied, such as charts, props and so on. Apart from that, the learning process at Gunungmulyo State Elementary School is mostly taking notes and listening to the teacher explain in front.

Based on the needs questionnaire, teachers use teaching materials in the form of textbooks and worksheets sourced from the Ministry of Education and Culture and other publishers. However, the available books do not yet integrate the material and questions from class V science and science learning questions CHAPTER 8 Bumiku Sayang Bumiku Malang, The Earth is Changing into everyday life, so that many students' learning outcomes are still below the low Minimum Completeness Criteria (KKM). Only 30% of the total number of students obtained KKM results from daily test scores. From a total of 15 students, the average student score was 66.5, then the highest score was 80 and the lowest score was 50. The distribution of student scores below the KKM (75), namely 10 students, 70% and student scores above the KKM (75), namely 5 students, 30%. This is because teachers still use simple textbooks so they lack motivation to learn. For this reason, it is necessary to develop available learning media which explain the material in a way that is easy to understand, the experimental activities are quite interesting, and the example questions used help to understand the material well.

Research regarding the development of Pop Up Book teaching media by (Malfia Atif 2021) with the title "Pop Up Book Media to Improve Student Learning Outcomes in Science Subjects in Elementary Schools" with the results of this research showing that the implementation of learning using Pop Up Book media has succeeded in achieving the criteria for completion. Data analysis shows that student learning outcomes from an average of 68.3 in cycle I increased to 86.1 in cycle II. An increase also occurred in the level of student completion, where in cycle I it was 50% to 88.9% in cycle II. Then (Nikmah, et al. 2019) in research entitled "The Influence of the Shared Type Integrated Learning Model Assisted by Pop Up Book Media on Learning Outcomes" explained that there was an increase in mid-semester grades which was more than before and there was an improvement in student character. The results of this research are confirmed by (Ariyani & Setyowati 2021) which shows that the posttest scores for the experimental class and control class from operational field test results provide a significant difference. The Pop Up Book developed was said to be effective because there was a significant difference between the control class and the experimental class. In line with research conducted by (Solichah & Mariana 2018) the results obtained showed that the experimental class that used Pop Up Book media based on local wisdom was higher than the class that did not use Pop Up Book. There is relevant previous research regarding the use of Pop Up Book media in elementary schools, including research results (Sentarik & Kusuma, 2020:

7-24) that pop up book media on the topic of the solar system in class VI elementary schools is valid in the very good category. Apart from classroom learning, Pop Up Book media is useful as reading material for students outside class hours. Research by Nugroho & Kurniati (2023) found that the use of Pop-Up Books based on local wisdom in science subjects can facilitate students' understanding of abstract material, especially in topics related to the natural world around them. This media also increases social interaction between students during the learning process. (Maryani, 2022) stated that the results of using Pop Up Book media in science subjects made students improve in learning. Thus, it can be seen from the enthusiasm of the students when the teacher displays the Pop Up Book media because when you open it you get a surprise on every page. The beautiful design and colors make students curious and ask a lot about Pop Up Book learning media. Researchers also found that there was no learning media that focused on material in the home and school environment, as well as introducing local wisdom from the area around students. The teacher only provides a few examples of local wisdom during the lesson.

The development of Pop Up Book learning media based on local wisdom is to support learning and link the material to the environmental conditions around where you live and school. The pop-up book was developed based on local wisdom in the Rembang area. The existence of Pop Up Book learning media will make it easier for fifth grade students at State Elementary School in Sarang sub-district to understand science and science subject matter and students will be able to recognize and remember the noble values contained in local wisdom. Learning media is made according to the character and needs of class V students. These teaching materials can also shape student character according to the Pancasila student profile. It is hoped that learning media can be used well so that it can make it easier for students to understand the lesson material.

Based on the background of the problem that has been explained, the researcher examines research of a developmental nature (Research and Development) with the title "Development of Pop Up Book Media Based on Local Wisdom to Improve Science and Technology Learning Outcomes for Class V Students of State Elementary School, Sarang District, Rembang Regency.

1.1 Conceptual framework

According to (Melin Sri Ulfa And Cut Eva Nasryah 2020: 10-16) the language Pop Up Book means appearing. What this means is that a Pop Up Book will have a certain shape appear on the paper when the page of the book is opened or pulled. This is in line with the opinion of Melin and Cut who say that a Pop Up Book is a type of book or card in which there are cut and folded images that will appear in the form of three-dimensional layers when the page is opened or pulled. (Apart from that, Aniq and Dewi 2020: 144) also stated that the Pop Up Book media is a book that can move and has a 3 (three) dimensional shape as well as providing a more interesting visualization of the story being displayed. The image from this Pop Up Book can move when the page is opened. (Ayu and Beta 2021: 35) defines a Pop Up Book as a book with a 3-dimensional effect, namely cutting, pasting and folding images placed between the 2 folded sides of the book. A 3-dimensional effect will appear when the book is opened. Pop Up Book is a new innovation that is presented in three-dimensional visual form with length, width and height so that it can be seen from all directions (Cahyo 2017). In line with this, (Shella et al. 2021:28-39) defines Pop Up Book as a book that has three-dimensional elements and provides an interesting story visualization from the display of images that can move when the page is opened or pulled.

From the opinions above, it can be concluded that a Pop Up Book is a type of 3-dimensional book, which contains folds and cut images so that when the page is opened or pulled, a certain shape will appear on the paper which can be seen from all directions. These are the things that will attract students' attention if Pop Up Books are used as learning media. With this, the Pop Up Book media can clearly be interpreted as a type of 3-dimensional book that can be used by teachers to convey information to students so that students' thoughts and feelings are encouraged to be active in every learning process because in a Pop Up Book there are folds and pieces of images that visualize learning material from all directions because in a Pop Up Book, if the page is opened or pulled, certain shapes will appear on the paper. Jean Piaget, in his theory of cognitive development, believed that school education must empower students, both male and female, to do new things based on creativity, discovery and discovery. These students must verify and be critical of everything they deal with. Piaget also believed that the goal of education is not just to repeat what has been done by previous generations, but rather to learn from it to further improve current and future efforts (Lillard, Lerner, Hopkins, Dore, Smith & Palmquist, 2013).

According to (Wahyu 2015: 3-6) local wisdom is defined as knowledge that comes from the culture of the local community. This local wisdom includes original traditions and practices or can also take the form of wisdom that has been around for a long time and developed in a particular area. This is in line with the Chamber's opinion which defines local wisdom as folk science, rural science, social science and indigenous folk science. According to (Tety Nur Cholifah and Luthfiatus Zuhro 2019: 3-6) local wisdom is knowledge in the form of customs, manners, norms, culture, language, beliefs and habits that already exist in society and are carried out continuously and are of good value for life. Rahyono (in Wibowo and Gunawan, 2015: 17) defines local wisdom as intelligence possessed by certain ethnic groups, which is obtained through the experience of that ethnic group grappling with its living environment. This local wisdom will be very strongly attached to certain communities/ethnicities. This is because the values of local wisdom have been tested and have gone through a long process, and are even almost as old as the existence of a particular community or ethnicity.

Based on the definitions above, it can be concluded that local wisdom is cultural knowledge and objects in an area, including customs, traditions, manners, norms, culture, language, beliefs, building architecture, works of art, traditional tools and all the rules that exist in the form of objects or wisdom that has long been used, ongoing and developed in a particular area which is then used as a guide to life by the people of that area. In general, each region has different uniqueness and traditions.

1.2 Research objectives

Developing and testing the effectiveness of Pop Up Book learning media based on local science and science wisdom for class V public elementary school students in Sarang District, Rembang Regency. This research includes needs analysis, design planning, feasibility testing, and evaluating the effectiveness of the media in learning.

2. Methodology

The research method used is research and development (Research and Development) according to Borg & Gall in (Sugiyono 2015:35). The research was carried out up to the seventh step, Research and Information Collecting, Planning, Develop Preliminary Form of Product, Main Product Revision, Mainfield testing, Operational Field Testing, Dissemination and implementation. Data collection techniques in this study were by observation, interviews, documentation, questionnaires. Data analysis used the N-Gain Test and the t Test. This research involved fifth grade students from several elementary schools in Sarang District, Rembang Regency. The sample included 40 students in the experimental group and 40 in the group.

3. Findings and Discussions

Improvements in student learning outcomes were analyzed using the average normalized N-gain. The recapitulation of the results of the gain analysis of student learning outcomes is shown in the table.

Table 1. Average Post Test and Pre Test Scores for Control and Experimental Classes

Kelompok	Rata-rata (%)		<i>n-gain</i>	Ket.
	Pre Test	Pos Test		
Kelas Eksperimen	64	88	0,7092	Tinggi
Kelas Kontrol	45	56	0,2039	Rendah

Based on the n-gain analysis of student learning outcomes in learning using Pop Up Book media based on local wisdom in Rembang class V Chapter 8 Bumiku Sayang, Bumiku Malang Topic A The Changing Earth, as shown in Table 1, the experimental class obtained an average gain score of 0.7092 which is classified as high. Meanwhile, the control class obtained an average gain score of 0.2039 which is included in the low category. This shows that the increase in learning outcomes in the experimental class is higher than in the control class. Referring to the n-gain effectiveness criteria (≥ 0.30), it can be concluded that the use of Pop Up Book learning media based on local wisdom Rembang class V Chapter 8 Bumiku Sayang, Bumiku Malang Topic A Bumi Changing is effective in improving student learning outcomes. Another research was conducted by Munisah et al (2021). The results of this research show that learning education can be more successful if it applies a learning approach that is fun, interactive, communicative. This finding is in line with research by Raesita et al. (2019), which shows that thematic-based pop-up media can improve student learning outcomes. In addition, Pamungkas et al. (2017) emphasized that learning based on local wisdom increases students' creativity and understanding, and Astriyanti et al. (2023) who found that pop-up book media was able to increase interest and learning outcomes. Then research by Iskandar et al. (2022) discusses the effectiveness of using Pop-Up Book media based on local wisdom in project-based learning in fifth grade elementary school. The research results show that this media not only improves student learning outcomes, but also shapes students' critical thinking skills and creativity in carrying out learning tasks. This research is in line with research by Noor Khamidah, Sri Utaminingsih, Mohammad Kanzunudin (2021) The development of Pop Up media based on local wisdom is effective in improving the learning outcomes of fourth grade elementary school students on the theme "The Area Where I Live. The research results show that Pop Up Book media is very effective in improving student learning outcomes.

Thus, the use of Pop Up media based on local wisdom has proven to be effective in improving student learning outcomes, because it provides learning that is more interesting, contextual and relevant to their culture.

3.1 Uji t

3.1.1 Uji Paired Sampel t Test

In the experimental class, action was given in the form of science learning using Pop Up Book teaching media which was based on local wisdom, material Chapter 8 Bumiku Sayang Bumiku Malang Topic A The Changing Earth was said to have an influence on student learning outcomes analyzed using the paired sample t test. The results of the paired sample t test are listed in the table below.

Table 2. Paired Samples Test

		Paired Differences			t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		
					Lower	Upper	
Eksperimen	Pre Test - Eksperimen - Pos Test Eksperimen	-24.075	3.467	.548	-25.184	-22.966	-43.918 39 .000
Kontrol	Pre Test - Kontrol - Pos Test Kontrol	-10.875	5.897	.932	-12.761	-8.989	-11.663 39 .000

Based on the results of the experimental group pair in Table 2 above, the value of $t_{count} = 43.918 > t_{table} = 2.0227$ and the value of Sig. (2-tailed) is $0.000 < 0.05$, so it can be concluded that there is a difference in the average student learning outcomes for the experimental class pre-test and the experimental class post-test which uses Pop Up Book learning media based on Rembang local wisdom. This finding is in line with research conducted by Liana et al. (2023), who developed Pop Up Book media based on local wisdom in social studies learning for fifth grade elementary school. The results of this research show that this media is valid and practical to use in learning, and is effective in improving student learning outcomes. In addition, research by Asriningrum et al. (2024) indicated that the development of E-Pop Up Book media based on local Trenggalek wisdom on water cycle material could improve the learning outcomes of fifth grade elementary school students. The needs analysis for this media received a positive response, showing its potential effectiveness in learning.

Thus, the use of Pop Up Book media based on local wisdom, as developed in this research, has proven effective in improving student learning outcomes. This media not only makes learning more interesting, but also links the material to the local cultural context, thereby increasing students' understanding and involvement in the learning process.

3.1.2 Independent Sample t Test

Differences in learning outcomes for class V students Chapter 8 Bumiku Sayang Bumiku Malang Topic A The Earth is Changing between Pop Up Book learning media based on Rembang local wisdom and conventional learning were analyzed using the Independent Sample t Test. The results of the Independent Sample t Test are listed in the table below

Table 3. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Mean Difference	Std. Error Difference
						Sig. (2-tailed)	
							Lower Upper
Hasi	Equal variances assumed	2.427	.123	-14.216	78	.000	-32.125 2.260 -36.624 -27.626

Equal variances not assumed	-14.21674.37 .000 0	-32.125	2.260	-36.627-27.623
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Based on the output of Table 3 above, the value of $t_{count} = 14,216 > t_{table} = 1.993$ and the sig value. (2-tailed) of $0.000 < 0.05$, it can be concluded that there is a difference in average student learning outcomes between the use of Pop Up Book learning media based on Rembang local wisdom and conventional learning. This finding is in line with research conducted by Liana et al. (2023), who developed Pop-Up Book media based on local wisdom in social studies learning for fifth grade elementary school. The results of this research show that this media is valid and practical to use in learning, and is effective in improving student learning outcomes. Additionally, a study by Asriningrum et al. (2024) indicated that the development of E-Pop Up Book media based on local Trenggalek wisdom on water cycle material could improve the learning outcomes of fifth grade elementary school students. The needs analysis for this media received a positive response, showing its potential effectiveness in learning.

3.2 Student and Teacher Response Questionnaire Results

The results of the questionnaire data on student responses to Pop Up Book media based on local wisdom consist of 3 aspects, namely enthusiastic attitudes, student interests & student abilities. Pop-Up Book learning media is very much needed by students and teachers, as evidenced by the results of the questionnaire measuring student and teacher responses. The student responses were obtained from the experimental class, namely 40 students from SD Negeri Kalipang and SD Negeri Sumbermulyo and SD Negeri Nglojo, 93.3% were categorized as very good. The teacher's response was taken from the 5th grade teacher, 86.25% gave a positive response with a very good category.

Thus, the use of Pop-Up Book learning media based on local wisdom has proven to be more effective than conventional learning in improving student learning outcomes. This media not only makes learning more interesting, but also links the material to the local cultural context, thereby increasing students' understanding and involvement in the learning process.

4. Conclusions

As stated in this research, development of Pop Up Book learning media based on local wisdom for class V science material, Chapter 8 "My Dear Earth, My Malang Earth, Topic A The Earth Changes." The research results show that this media has succeeded in meeting the criteria for student and teacher needs, and is applied in learning that involves images, materials, activities and evaluation questions that are relevant to local wisdom. Validation from material experts and media experts shows that this media is very suitable for use, with test results showing a significant increase in student learning outcomes. The use of Pop Up Book media based on local wisdom has proven to be effective in improving student learning outcomes in the experimental class, compared to the control class. Positive responses also came from students and teachers, indicating that this media is interesting and can increase motivation and understanding of the material.

Apart from that, the learning process should be able to adapt suitable material and be able to arouse student responses and interest in learning. Students should be able to utilize the Pop Up Media products that are being developed, namely by learning using Pop Up Book based on local wisdom so that students are directly and actively involved in learning, and it is hoped that teachers can utilize Pop Up Book products based on local wisdom to improve learning outcomes.

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Conflict of Interest

The authors declare there is no conflict of interest

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