

Development of PAI and Character Media Based on Pop-up Books and Kahoot Using Methods Problem Based Learning

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ABSTRACT

This research is based on pre-research conducted on class VIII F students at SMPN A, class VIII C students at SMPN B and class VIII D students at SMPN C by distributing questionnaires to students. The results obtained are that there is limited use of media and learning methods so that students are less interested in learning in class. The objectives of this research are (1) to determine the development of pop-up book media (2) to determine the efficiency of the media being developed and (3) to determine the effectiveness of using pop-up book media. This research uses the Research and Development method with the ADDIE model, namely: analysis, design, development, implementation and evaluation. Data collection uses validation sheets, student questionnaires, teacher interviews, observation and documentation using qualitative and quantitative data analysis techniques. The media and method assessment were carried out by five experts consisting of PAI teachers and PAI lecturers. The results of the media validation test were 97% and the material validation test was 96% (fit for use). And the results of the N-Gain pretest-posttest scores at the 3 schools showed SMPN A 84% (effective), SMPN B 70% (quite effective), and SMPN C 70% (quite effective).

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1. INTRODUCTION

Employing educational media is crucial in enhancing the efficiency of the learning procedure [1]. Learning media offers advantages as it serves as a tool for delivering educational content in a manner that aligns with learning objectives. Additionally, it enhances comprehension, making the material more accessible to students. Moreover, it adds an element of enjoyment to the learning experience, fostering enthusiasm and interest among students, thus encouraging active participation in learning activities [2] [3].

Based on the results of distributing a questionnaire consisting of three indicators, namely teaching style, interaction ability and personal characteristics of teachers distributed to students at SMPN A, SMPN B and SMPN C, the results of the questionnaire were that at SMPN A 27 students (96%) felt less interested and 1 student (4%) felt not interested. At SMPN B 29 students (97%) felt less interested and 1 student (3%) felt uninterested. At SMPN C, 27 students (96%) felt less interested, and 1 student (4%) felt not interested. The majority of students who distributed the questionnaire were less interested in learning activities in class because educators still used simple media such as textbooks, worksheets and power points.

The solution to solving this problem is to develop media theoretically and according to learning needs and student characteristics. The advancement of educational tools is pivotal in enhancing the efficiency of the learning process [4] [5]. Pop-up books and Kahoot media, utilizing the problem based learning approach, represent a category of educational tools that engage students' focus.

Pop-up books are a genre of books featuring images that unexpectedly emerge when the pages are opened, producing a fascinating and engaging three-dimensional effect. This characteristic heightens students' interest and

curiosity [6] [7] [8]. Incorporating pop-up books into the learning process offers a highly engaging and interactive visual experience for students. This approach serves to reinforce their comprehension of the study material [3] [9] [10]. Utilizing pop-up books encourages active student participation in the learning process [11]. Pop-up books facilitate students in comprehending challenging concepts through a more visual and interactive approach [12]. Thus, incorporating pop-up books presents a significant opportunity to enhance learning effectiveness and reinforce students' understanding of the study material.

The selected approach involves employing the problem-based learning method, as it possesses the ability to inspire students to actively participate in the learning process [13]. Problem-Based Learning is employed to stimulate advanced thinking in situations oriented around problems, encompassing the development of critical thinking skills [14]. Through the implementation of Problem-Based Learning, the objective is for students to actively explore and discover solutions to the problems raised during the classroom learning process [15] [16].

In light of the furnished data, the researchers demonstrate a keen interest in creatively enhancing learning media by developing materials in the format of pop-up books and Kahoot media. The chosen pedagogical approach involves incorporating the Problem-Based Learning method. The aim is for this learning media to enhance students' understanding of the concept of the creation of nature and humans as a manifestation of Allah SWT's power. Consequently, the researchers are motivated to undertake research and development under the title "Development of PAI and Character Media Based on Pop-up Books and Kahoot Using the Problem-Based Learning Method."

2. METHOD

2.1. Development Design

The research methodology employed is Research & Development, focusing on creating a specialized product and evaluating its effectiveness [17] [18]. Research & Development (R&D) aims to expand and deepen existing knowledge through the development of certain products and testing their effectiveness [19]. The employed development model is the ADDIE model, initially conceived by Robert Maribe Branch. The ADDIE model comprises five stages: Analysis, Design, Development, Implementation, and Evaluation [3] [20][21].

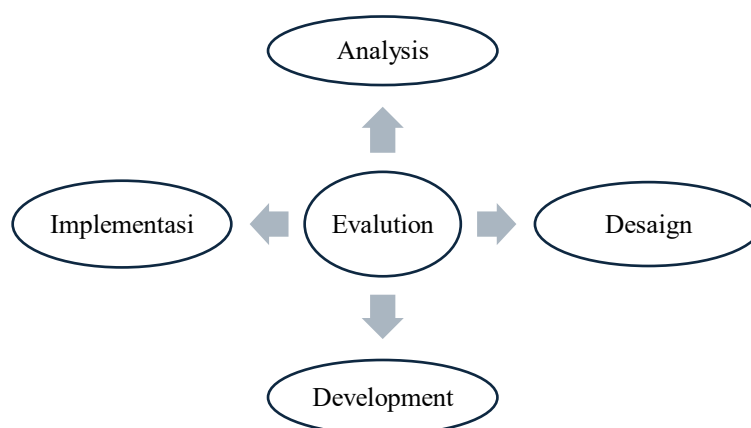


Figure 1. ADDIE Stages

The researchers opted for the ADDIE research type because this model is systematically structured with a sequence of activities, aiming to address learning problems associated with developing educational resources that align with the specific needs and characteristics of the learners.

2.2. Research Subject

The research subjects were class VIII students at 3 junior high schools. The researchers employed a diverse selection of schools with the objective of assessing the impact and effectiveness of using pop-up book media across various educational institutions. This approach seeks to evaluate the suitability and viability of this learning medium.

2.3. Research Instrument

Data collection instruments are tools for obtaining data from research conducted [22] [23]. The instruments used for this research used media and material validation sheets, student interest questionnaires for learning media, student questionnaires for teacher performance, student questionnaires for learning interest and student response questionnaires for pop-up book media is employed within the learning process. The questionnaire measurements use a Likert scale. The Likert scale is a measurement tool utilized to assess the attitudes, opinions, or perceptions of a group of individuals concerning events. It employs a scale ranging from 1 to 4, with descriptive interpretations such as feasible, quite feasible, and not feasible [24].

In this research, media validation refers to the validation aspect which consists of 4 indicators, namely format, content, language, practicality and effectiveness [24]. With the following criteria:

Table 1. Indicators for Pop-up Book Media Validation Assessment

No	Indicator	Information
1.	Format	media color
		clarity of writing and letters
		neatness of layout
2.	Fill	material according to the indicators
		the ability of the media to explain the material
		the attraction of material in the media
3.	Language	language effectiveness
		effective use of words
4.	Practical	practical media used
5.	Effective	media is easy to apply

This media validation assessment was carried out by 3 PAI teachers and 2 PAI lecturers who are experts in learning media, the results of which were scores, criticism and suggestions for the pop-up book media. Afterward, the data is subjected to qualitative and quantitative statistical analysis based on the Likert scale, as outlined in table 2 below:

Table 2. Validation Criteria for Pop-up Book Media

Category	% Interval
Worthy	>75%
Quite decent	47-71%
Not worthy	<46%

Material validation refers to the validation aspect which consists of 3 indicators, namely content, construction and language [24]. With the following criteria:

Table 3. Material Validation Assessment Indicators

No	Indicator	Aspect
1.	Fill	Conformity with KD
		Suitability of material to teaching needs
		Ease of understanding the materials
2.	Construction	Suitability of material to students' ability level
		Clarity in learning objectives
		The order of presentation in the material
3.	Language	Clarity in providing information
		Conformity with Indonesian language rules
		Use of dialogue or text that is interesting and leads to understanding of concepts

The validation assessment of this material was carried out by 5 PAI teachers, the results of which were scores, criticism and suggestions for the pop-up book media. Subsequently, this data undergoes processing through both qualitative and quantitative statistical analyses utilizing a Likert scale, as illustrated in Table 4 below:

Table 4. Material Likert Scale

Category	Percentage
Valid	>75%
Quite valid	47-71%
Less Valid	<46%

2.4. Data Analysis Techniques

The data was acquired through data instruments, including validation sheets and the distribution of student questionnaires focused on learning using pop-up book media. Additionally, distributing questionnaires to media experts and content specialists served as a guide in the development of pop-up book teaching media. Apart from that, this questionnaire also contains statements of the respondents' attitudes during the research. After distributing the

questionnaire, researchers will begin processing the data using qualitative data types with descriptive models to clarify data analysis using validation sheets, questionnaires and tests. To find out this, researchers refer to the Likert Scale to explain validation sheets and questionnaires [25]. The percentage formula used is:

$$P = \frac{F}{N} \times 100\%$$

Information:

P = Percentage Number (percentage of validity)

F = Validity answer score

N = Number of cases (number of frequencies)

The processing of quantitative data involves employing normality tests, Wilcoxon tests, McNemar tests, and N-Gain tests. The objective of data analysis is to assess the effectiveness of media use. However, before determining the effectiveness, a normality test is conducted on the data to ascertain whether it conforms to or approximates a normal distribution [26].

The researchers employed learning outcomes tests in the form of pretest and posttest questions. Pretest questions are given at the beginning of the lesson before the material is presented in order to determine their level of knowledge. Towards the conclusion of the lesson, students are administered posttest questions to assess their understanding after being exposed to the material. The evaluation of the effectiveness of pop-up book learning media, coupled with problem-based learning methods, in enhancing students' enthusiasm during classroom learning can be gauged through the analysis of both pretest and posttest results.

3. RESULTS AND DISCUSSION

The learning media developed by the researchers is pop-up book media, utilizing the Problem-Based Learning method. This particular media focuses on the subject matter related to the creation of nature and humans as a manifestation of the power of Allah SWT. The software for creating this media content is Microsoft Word, then it is assembled on Asturo paper which has been formed into a book binding. In the development of this learning media, researchers opted for the ADDIE model, a framework comprising five systematic stages, chosen for its simplicity and suitability for beginners. Certainly, here are the steps that researchers typically follow in developing pop-up book learning media based on the ADDIE model:

3.1. Analysis

Analysis is an activity carried out to find out the problems that occur so as to find solutions to these problems. At this stage, researchers begin to analyze problems in the form of learning conditions that occur and other problems. This stage can be done by observing the research site to find out the problems that occur so that later researchers can find solutions to these problems. In this stage the researcher analyzes teacher characteristics, student characteristics and needs analysis.

3.1.1. Analysis of PAI Subject Teacher Characteristics

Researchers conducted observations at three schools by interviewing PAI subject teachers at each school. Among the three schools, it is noteworthy that teachers of the PAI subject have not previously incorporated pop-up book media into their teaching and learning practices. Of the three schools, the PAI subject teachers in teaching and learning did not use media. Only use textbooks and the teacher explains more of the material and gives assignments.

3.1.2. Analysis of Student Characteristics

Researchers conducted classroom observations to find out how students were doing during teaching and learning and analyzed student characteristics by interviewing teachers regarding students in class. Results obtained from interviews with PAI teachers at SMP Negeri 10 Salatiga. Students tend to be busy when the material is explained and pay less attention to the teacher.

Observations carried out at SMPN A with a total of 30 students found that the teacher seemed unable to handle class conditions because he did not pay enough attention to the students at the back so that class conditions were not conducive. Observations at SMPN B and SMPN C found that students experienced boredom in learning so that students lacked enthusiasm and were bored.

3.1.3. Needs Analysis

Results of interviews with class VIII PAI teachers at 3 junior high schools and distribution of questionnaires to students regarding teacher performance. Researchers found several solutions to several problems within the school. Based on these findings, one can infer that incorporating diverse learning media and having proficiency in various teaching methods are crucial elements for establishing an engaging and active learning environment. This approach aims to address situations where classes may be less active, promoting student participation and enhancing the overall effectiveness of the learning experience. The distribution of questionnaires regarding student perceptions of teacher performance is based on 3 indicators, namely: teaching style, ability to interact with students, and personal characteristics (Mardiah & Astuti, 2021: 55).

Table 5. Questionnaire Grid for Student Perceptions of Teacher Performance

Indicator	Aspect
Teaching style	Ability to motivate students
	Ability to use learning media
	Ability to manage class
Ability to interact with students	Verbal communication
	Non-verbal communication
Personal characteristics	Teachers are fair to students
	Teachers can be examples
	Treat students with compassion and avoid acts of violence

Table 6. Criteria for Student Perception Questionnaire Assessment of Teacher Performance

Category	%Interval
Very interesting	> 78%
Interesting	51 - 75 %
Not interesting	<50%

3.2. Design

At this stage, the researcher initiates the planning process, which involves strategizing how to select the media to be developed, designing the creation of the media, specifying the content that will be taught, and outlining the initial plan for crafting pop-up book media. The steps used include:

- 1) The selection of media is aligned with the analysis of teachers, students, and needs that was conducted at the initial stage. The researchers will now advance to the development phase of pop-up book learning media based on the gathered information and insights.
- 2) The material chosen is material created by nature and humans as a sign of the power of Allah SWT.
- 3) The theme chosen by the researcher is a vintage theme with an aesthetic feel. The vintage theme provides a classic atmosphere. With a combination of black and brown, of course this theme is very suitable because this theme is currently very popular with the millennial generation. And then collaborate with the nuances of natural scenery.
- 4) The technique used by the researcher is: a) The technique used by the researcher is the basic cut and fold technique, b) The scissor paste technique. This technique is the easiest technique, c) Lift the flap technique, which is a technique by arranging or stacking several pieces of paper so that they can be opened and closed again, d) Carausel technique, which is a technique for making pop-up books using string, ribbon or buttons, which if it happens Open it will display text or images.

3.3. Development

3.3.1. Pre-Production

During this stage, researchers initiate the creation of learning products or media that will be utilized in the learning process. The researcher edited the material into Microsoft Word and edited it with a choice of several attractive fonts and elegant colors so that the appearance of this book is more attractive than a package book. And at this stage the media and materials will be validated by experts and can then be implemented in schools. Following are the steps for creating pop-up book media, as follows:

- a. Making the cover using cardboard covered with black Asturo paper.



Figure 2 Photo of Cover Making

- b. Cut out some asturo paper and samson paper then stick them between one paper and another until a book page is formed.
- c. Design the writing in Microsoft Word to be used on the book cover using an attractive font.
- d. Likewise, other material is also edited using the same method as step three.

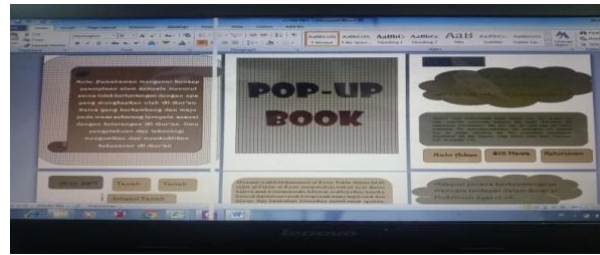


Figure 3 Making Material in Mc. Word

- e. After editing in Microsoft Word, the material is saved in PDF form.
- f. Then prepare an interesting picture according to the material theme, namely nature and humans. Search for images on the internet then transfer them to Microsoft Word then save them in PDF form.
- g. After the written material and images are printed, they are then neatly cut into several texts and images.
- h. Prepare pieces of asturo paper using the popup book making technique.

3.3.2. Production

The development of pop-up book media involved the utilization of four techniques, namely: basic folding and cutting technique, stick-on scissors technique, lift-the-flap technique, and carousel technique [27]. The contents of the developed pop-up book include:



Pop-up book cover



First page



First subject



Natural creation material



Purpose of natural creation



The wisdom of studying the material



Second subject



Human creation material

Figure 4 Pop-up Book Media Development

3.3.3 Post-production

The validation test for this media was conducted by PAI (Islamic Education) lecturers and PAI subject teachers at three schools. The evaluation included furnishing a validation sheet to assess the appropriateness of the pop-up book medium. Following this, the results were converted according to the Likert scale. The material validation test involved distributing assessment sheets to assess the suitability of the material. The comprehensive validation results from all validators can be observed in Table 7 and Table 8.

The results of the media validation test by V1 were 100%, V2 was 92%, V3 was 96%, V4 was 100% and V5 was 96%. The average percentage of the five validators shows a score of 97%. The aforementioned results suggest that the pop-up book medium is classified as suitable for use, according to the Likert scale categories specified in Table 2.

As for the next table, it can be seen that the results of material testing by V1 are worth 100%, V2 are worth 96%, V3 are worth 100%, V4 are worth 92% and V5 are worth 92%. And shows an average percentage score of 96%. These results indicate that the material is in the valid category for use according to the Likert scale categories in table 3.

3.4 Implementation or application

The implementation stage is an activity using media that has been developed in real class [28]. The researchers started incorporating this medium into the educational process, adhering to the outlined research plan, in order to evaluate its effectiveness through testing with students. During this stage, researchers will employ the designed and developed media by testing it on students to enhance the learning process. This will involve distributing questionnaires to gather students' responses and feedback regarding the pop-up book media. The student response questionnaire refers to 3 indicators, namely learning design, operations and visual communication [29].

Table 7. Questionnaire Grid for Student Responses to Pop-up Book Media

No.	Indicator	Information
1.	Learning design	Ease of understanding the material using learning media
		Student learning independence with the help of media
		Interest in learning with the help of media
2.	Operational	Ease of using media
3.	Visual communication media initial display	Clarity in instructions for use
		Clarity of writing in the media
		Suitability of color size and image resolution on the media
		The language used in the media is easy to understand

Following are the students' responses to the pop-up book media as follows:

a. SMPN A

Researchers conducted research in class VIII F with a total of 28 respondents. The questionnaire results from three aspects with 10 categories. Students are categorized as very interested in pop-up book media with a percentage of 100%, the interesting category gets a percentage of 0% and the uninteresting category gets a percentage of 0%.

b. SMPN B

Researchers conducted research in class VIII C with a total of 30 respondents. The questionnaire results indicate that students exhibit a high level of interest in pop-up book media across three aspects and ten categories. Specifically, students are categorized as "very interested" with a percentage of 83%, while the "interesting" category has a percentage of 17%. No students fall into the "uninteresting" category, reflecting a positive overall response to the pop-up book media.

c. SMPN C

Researchers conducted the research in class VIII D, comprising a total of 28 respondents. The questionnaire results were gathered from three indicator aspects: learning design, operational use, and visual communication, each consisting of 10 questions. Next, the results are adjusted to the Likert scale categories. The questionnaire's distribution results indicate that students are highly interested in pop-up media, with 93% falling into the "very interested" category. The "interesting" category has a percentage of 7%, while none of the students fall into the "unattractive" category, suggesting a positive and engaging response to the pop-up media. The interest of students from these three schools increased after learning was conducted using pop-up book media. The findings regarding the enhancement of student interest were acquired through the distribution of questionnaires to students, focusing on four indicators: feelings of happiness, student attention, interest, and student involvement [30]. The following is the student interest questionnaire grid as follows:

Table 8. Student Interest Questionnaire Grid for Pop-up Book Media

Indicator	Information
Feeling happy	Students' opinions about PAI learning
	Students' impressions during PAI learning
	Students' feelings during PAI learning
Attention	Pay attention when taking PAI lessons
	Students' attention when the teacher gives appreciation
Interest	Students' curiosity when participating in PAI learning
	Students' acceptance when given a challenge by the teacher
Studenty involvement	Students' attention when teacher explains the material

Students' interest in learning has increased. The interest of class VIII F students at SMPN A as many as 28 students obtained a percentage of 89% with high interest criteria, medium interest criteria with a percentage of 11%, and low interest criteria with a percentage of 0%. The interest of 30 students in class VIII C at SMPN B obtained a percentage of 90% with high interest criteria, medium interest criteria with a percentage of 10%, and low interest criteria with a percentage of 0%. There were 28 students in class VIII D at SMPN C with a percentage of 75% with high interest criteria, medium interest criteria with a percentage of 25% and low criteria with a percentage of 0%.

3.5 Evaluation

Before designing the media, the researcher made observations at three schools, namely SMPN A, SMP N B, and SMPN C as research sites. The observations reveal that throughout the learning process, media usage is constrained to textbooks, with teachers primarily relying on the lecture method. This situation contributes to students being occupied and paying less attention to the teacher's explanation. After knowing the research needs, the researcher began designing media using several tools and materials in the form of cardboard, Asturo paper, Manila cardboard, Samson paper, sticky note paper, HVS paper, hemp rope, paper glue, double tip, scissors, ruler, and pictures. has been printed.

The effectiveness of incorporating pop-up book media into learning is assessed by analyzing the pretest and posttest outcomes using the N-Gain test. The N-Gain Score test is employed to determine the effectiveness of particular media or methods within an intervention [31]. Prior to conducting the N-Gain test, the pretest and posttest scores underwent examination through the Normality test, Wilcoxon test, and McNemar test.

3.5.1 Normality Test

The normality test is a prerequisite test employed to evaluate whether the distribution of data within a dataset follows a normal distribution or not [32]. If the distribution is normal, researchers can proceed with parametric analysis; however, if the data does not exhibit a normal distribution, it is advisable to opt for non-parametric analysis. Please provide the specific results of the normality test from the pretest and posttest results at the three schools using Microsoft Excel software, and I'll do my best to assist you with the interpretation or any further steps. With the Shapiro Wilk Test formula:

$$T_3 = \frac{1}{D} \left[\sum_{i=1}^k a_i (X_{n-i+1} - X_i) \right]$$

Statistical analysis: If the significance (sig.) is greater than α (0.05), the data is considered to follow a normal distribution. Conversely, if the significance is less than α (0.05), it indicates that the data does not exhibit a normal distribution.

The T3 value from the normality test at SMPN A is pretest 0.90 and posttest 0.01. The T3 value from the normality test at SMPN B is pretest 0.01 and posttest 0.00. The T3 value of the normality test results at SMPN A is pretest 0.89 and posttest 0.01. The outcomes from the normality test indicate that the p-value for the T3 statistic is below 0.05. This leads to the conclusion: "If the computed T3 value is less than α 0.05 or the p-value is <5%, the data is deemed to be not normally distributed". So, the next test uses a non-parametric test.

3.5.2 Wilcoxon Test

This examination is conducted when the data does not follow a normal distribution. The Wilcoxon test is a type of non-parametric analysis for data from two paired samples. The Wilcoxon test is utilized to ascertain whether there is a significant difference in the means between two samples or two paired groups. The basis for decision making in the Wilcoxon software test with IBM SPSS Statistics 24 for Windows that needs to be understood is [33]:

- If the Asymp.Sig (2-tailed) value is <0.05, then Ho is rejected, and Ha is accepted.
- If the Asymp.Sig (2-tailed) value is > 0.05, then Ho is accepted, and Ha is rejected.

The following are the Wilcoxon test results from the pretest and posttest results as follows:

Table 9. Test Statistics Wilcoxon Test for SMPN A

Test Statistics ^a	
	posttest – pretest
Z	-4.650 ^b
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

The SPSS output indicates that the Asymp. Sig (2-tailed) value is 0.000. Since this value is smaller than 0.05 (assuming a typical significance level of 0.05), it suggests a statistically significant influence on the average student learning outcomes related to the use of pop-up book media. In practical terms, this implies that there is a meaningful and statistically supported impact on student learning outcomes when utilizing pop-up book media.

Table 10. Test Statistics Wilcoxon Test for SMPN B

Test Statistics ^a	
	posttest – pretest
Z	-4.939 ^b
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

The SPSS output indicates that the Asymp. Sig (2-tailed) value is 0.000. Since this value is less than 0.05 (assuming a typical significance level of 0.05), it indicates a statistically significant influence on the average student learning outcomes in relation to the use of pop-up book media. In other words, there is a significant impact on student learning outcomes associated with the use of pop-up book media.

Table 11. Test Statistics Wilcoxon SMPN C Test

Test Statistics ^a	
	posttest – pretest
Z	-4.659 ^b
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

According to the SPSS output, the Asymp. Sig (2-tailed) value is 0.000. As this value is less than 0.05, it indicates a statistically significant influence on the average student learning outcomes with respect to the utilization of pop-up book media.

3.5.3 Mc Test. Nemar

Mc Test. This Nemar includes non-parametric statistical tests for data that has two paired samples. Mc Test. Nemar is useful for knowing the differences in conditions before and after treatment. The basics for decision making in the Wilcoxon software test with IBM SPSS Statistics 24 for Windows that need to be understood:

- If the Asymp.Sig (2-tailed) value is <0.05, then Ho is rejected, and Ha is accepted.
- If the Asymp.Sig (2-tailed) value is > 0.05, then Ho is accepted, and Ha is rejected.

Table 12. Mc Test. Nemar SMPN A

Test Statistics ^a	
	pretest & posttest
N	28
Chi-Square ^b	26.036
Asymp. Sig.	.000
a. McNemar Test	
b. Continuity Corrected	

The McNamar statistical test results above show statistical test results of 0.00 and smaller than 0.05. So, HO was rejected, and HI was accepted with the explanation that there was a difference in learning outcomes between the pretest and posttest after using the pop-up book media.

Table 13. McNamar Test SMPN B

Test Statistics ^a	
	pretest & posttest
N	30
Chi-Square ^b	28.033
Asymp. Sig.	.000
a. McNemar Test	
b. Continuity Corrected	

The McNamar statistical test results above show statistical test results of 0.00 and smaller than 0.05. Certainly, Ho was declined, while HI received approval, citing a variation in educational achievements observed in the pretest and posttest following the utilization of pop-up book media.

Table 14. McNamar Test SMPN C

Test Statistics ^a	
	pretest & posttest
N	28
Chi-Square ^b	25.037
Asymp. Sig.	.000
a. McNemar Test	
b. Continuity Corrected	

The McNamar statistical test result above shows statistical test results of 0.00 and smaller than 0.05. Thus, Ho faced rejection, whereas HI obtained approval, justified by the observed disparity in learning outcomes from the pretest to the posttest following the incorporation of pop-up book media.

3.5.4 N-Gain Test

The decision-making process for the N-Gain Score test relies on Microsoft Excel software and employs the following formula:

$$N - Gain = \frac{\text{Posttest score} - \text{Pretest score}}{\text{Ideal score} - \text{Pretest score}}$$

Then the results of the data are adjusted to the N-Gain criteria table below:

Table 15. N-Gain Criteria

Score Range	Criteria
≤ 0,3	Low
0,3 – 0.7	Currently
≥ 0,7	High

The following table shows the interpretation categories of N-Gain effectiveness:

Table 16. Category Interpretation of N-Gain Effectiveness

Percentage	Interpretation
<40	Ineffective
40 - 55	Less Effective
56 - 75	Effective Enough
>75	Effective

The following are the results of processing the N- Gain Score test data on the pretest and posttest results:

- The N-Gain pretest and posttest scores for Class VIII F students at SMP N A, comprising 28 students, yielded a N-Gain score of 0.84, indicating a high level of achievement based on the established criteria.
- The N-Gain pretest and posttest scores for Class VIII C students at SMP N B, involving a total of 30 students, resulted in a N-Gain score of 0.70, reflecting a moderate level of achievement according to the specified criteria.
- The N-Gain pretest and posttest scores for Class VIII D students at SMP N C, encompassing a total of 28 students, yielded a N-Gain score of 0.70, signifying a moderate level of achievement based on the established criteria.

From the results of % N – Gain Pretest – Posttest, we can obtain the following data:

- The percentage N-Gain pretest and posttest scores for students in Class VIII F at SMP N A, consisting of 28 students, resulted in a %N-Gain score of 84, categorizing it within the effective range.
- The N-Gain pretest and posttest scores for Class VIII C students at SMP Negeri B, comprising a total of 30 students, yielded a N-Gain score of 70, placing it within the category of "quite effective".
- The N-Gain pretest and posttest scores for Class VIII D students at SMP N C, involving a total of 28 students, resulted in a N-Gain score of 70, categorizing it as "quite effective".

Based on the gathered data, a conclusive inference can be drawn that the utilization of pop-up book media is quite effective in enhancing students' comprehension of the material. This is supported by the percentage of N-Gain scores, as demonstrated across three different schools.

4. CONCLUSION

The researchers utilized the Research and Development (R&D) methodology, opting for the ADDIE model in the creation of pop-up book learning media. The selection of this model was guided by the systematic nature of its development and the perceived simplicity of its stages. The researcher's stages in completing this research are based on the ADDIE model, namely.

- a. The initial phase involves analyzing the prevailing conditions within the school.
- b. The second stage entails designing pop-up book media by specifying the subject matter, creating the textual content using Microsoft Word, and sourcing visual references from the internet, among other methods.
- c. The third step is developing the media using Microsoft Word and starting to design the pop-up book. Subsequently, the developed media underwent validation by both media experts and material experts. The validation process involved assessments from these experts. As per the feedback from media experts, the pop-up books were deemed suitable for implementation. The results of media validation obtained an average score of 97% with criteria suitable for use. Meanwhile, material experts got an average score of 96% with valid criteria.
- d. The fourth step implements the three schools. Researchers distributed questionnaires to students to find out their response to pop-up book media. The results obtained were that SMP N A got an average score of 93%, SMP N B got an average score of 83% and SMP N C got a score of 100%. From these three schools, the data obtained can be categorized as those who are very interested in learning using pop-up books.
- e. The fifth step involves evaluation, wherein the researcher analyzes the research results to draw conclusions and insights.

The N-Gain test was carried out to evaluate the effectiveness of pop-up book media in three schools. At SMP Negeri 10 Salatiga, the data obtained, according to the N-Gain Score criteria table, indicated a value of 0.8, classifying it as "high" based on the criteria. And the N- Gain Score percentage results in the table show a result of 84 with the criteria "effective". And at SMP Negeri 2 Tuntang, data obtained according to the N-Gain Score criteria table obtained a value of 0.7 with "medium" criteria. And the N- Gain Score percentage results in the table show a result of 70 with the criteria "quite effective". And at SMP Negeri 1 Boja, data obtained according to the N-Gain Score criteria table obtained a value of 0.7 with "medium" criteria. And the N- Gain Score percentage results in the table show a result of 70 with the criteria "quite effective". Based on the data gathered earlier, one can infer that the effectiveness of pop-up book media in enhancing students' comprehension of the material is evident, as indicated by the N-gain score test percentages observed in three different schools.

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