The Improvement of Science Media Project Based on Scrapbook to Improve Teaching Material Design Skills of Prospective Primary Teacher Students

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Abstract

The aims of this research were to develop a scrapbook-based science media project to improve the design skills of prospective elementary school teachers. This research used quantitative research with the Research and Development (R&D) research method . With the ADDIE development model, this research used analysis, design, development, implementation and evaluation. The results of this research based on media experts clearly showed that in the media aspect, the technical quality of the scrapbook and the size of the media have a presentation value of 82.26%, 89.05%, 91.92%, so it is concluded that the results is very good. A linguist's analysis clearly showed that in terms of language clarity, suitability for student development, the size of conformity to language rules with presentation scores was 85.46%, 89.75%, 92.32% , so it was concluded to be very good . The results of the material expert analysis clearly showed that in terms of material coverage, material accuracy, up-to-dateness and stimulating desire, media presentation with presentation values was 87.56%, 89.84%, 93.12%, 90.44%, 91.61%, so it can be concluded that the results is very good. A feasibility analysis clearly showed that in the aspects of coverage of language rules, presentation of material, and coverage of conformity with presentation scores of 90.08%, 91.45%, 90.11%, it is concluded that it is very feasible. The results of the gain normality test analysis were 0.81, so it can be concluded that there has been an increase in the design skills of prospective elementary school teacher students in the high category. This was caused by scrapbook- based science media products using

decorations in the form of pictures, photos and important notes that were interesting to students so that the students concentrate more on learning. The scrapbook-based science media project can improve science learning literacy.

Keywords: *Science Media Project, Scrapbook , Design Skills*

A. Introduction

The media project is an activity of creating a unique medium used to convey the science lessons so that they become interesting, useful, easy and effective. The educational media is anything that is used to convey messages and this can stimulate the thoughts, feelings, attention and the will of the learner so that it can encourage a learning process that is deliberate, purposeful and controlled (Arifin et al., 2015) . In the learning process, of course a teacher must use various learning materials and learning media so the students can easily understand the material, in addition to so that the learning process can run well and becoming interesting. Each material is a resource for teachers and students to carry out the learning process. Therefore , it is necessary to develop innovative teaching media that enable students to achieve superior learning outcomes (Anjarwati et al., 2023) . The media of science created as teaching materials are prepared with several objectives. The goals are to make learning activities more interesting (Legendari & Raharjo, 2016) , to improve critical thinking skills (Syehab et al., 2023) , to increase scientific literacy (Agustin et al., 2021) and making students more independent in learning (Muchyidin, 2017) . Media as a teaching material is an important part of most teaching programs ranging from textbooks, video tapes and images to the internet. The teachers will experience difficulties in increasing the effectiveness of their learning if they are not accompanied by complete teaching materials. Likewise, for students without teaching materials, the students will experience difficulties in learning. The teachers rely heavily on a variety of materials to support their students' teaching and learning (Mahmudovna, 2023) . Therefore, a professional teacher must have the skills to design teaching materials so they can guide students in understanding learning, train students' independence, and the students can think critically.

Design skills are the ability or the expertise to combine ideas, images, knowledge and many other components to create or to develop products that have never existed before (Gozen & Acer, 2012) . The skill of designing teaching materials is the expertise or ability to develop a set of materials that are arranged systematically, both written and unwritten, so to create an environment/atmosphere that allows students to learn because teaching materials

are a carrier for students to acquire knowledge, a tool for teachers to instill skills and to develop abilities of students (Ribosa & Duran, 2022) . There are several types of teaching materials themselves if seen in printed form, such as hand out of textbooks , modules , the student activity sheets (*Student Work Sheet*) , the brochures as well as photos /drawings (Danis & Panggabean, 2022) .

Along with the development and the creativity of human media as a teaching material, it can be packaged well so that it can attract students' interest and motivation, like a scrapbook. The scrapbook cames from a combination of two words, namely scrap, which means leftover items, and book, which means book, it is an art of decorating and designing photos using leftover materials. The scrapbooks can be used as an interesting learning medium because they contain pictures, photos and other decorations that have various colors and shapes. The various stickers from various materials can be combined with writing with an attractive color combination so that scrapbooks can influence students' learning motivation (Rambe et al., 2022) ; (Fauziyah et al., 2020) , to increase creativity (Muktadir, et al: 2020), to improve problem solving abilities (Zaenah et al., 2019) ,to improve learning outcomes ((Rahmawanti et al., 2019) ; (Quroesin et al. ., 2022) , increasing interest in learning, increasing visual science literacy (Wusqo et al., 2021) . Therefore, a teacher is required to have the ability to develop teaching materials used to convey material in the classroom, one of which is by developing science media. The developing science media projects for teachers and prospective teachers is very important because it becomes a provision when entering the world of learning at school.

The results of the researcher's observations after interviews with the students in the PGSD study program found that during the learning process students had difficulty in creating and developing learning media. This was due to the lack of facilities such as inadequate laboratories so that the students were less skilled in creating science media, for this reason it was necessary to develop science media for the students. . Based on the description above, the researchers are interested in conducting research on the development of a scrapbook based science media project to improve the skills of designing teaching materials for prospective elementary school teachers. This is in line with research results (IP Sari et al., 2020) that scrapbooks are very good to be used as learning media. A similar thing was expressed (Asih et al., 2020) that scrapbooking can improve skills.

B. Method

The type of this research is quantitative research with the Research and Development (R&D) research method. According to Sugiyono in Riyanto (2020) This R&D research aims to develop products based on findings and then revise them and so on. This research will produce a product, namely a scrapbook. The ADDIE model is a learning system design model that shows the basic stages of a learning system that are easy to carry out . There are five stages in the ADDIE development model, namely: 1) analysis, 2) design, 3) development, 4) implementation, 5) evaluation (Hamzah, 2021)
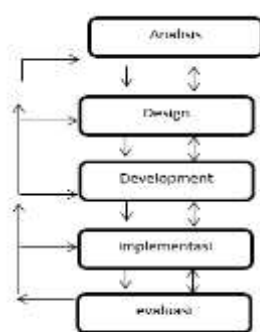
Pictuic: 1 ADDIE development steps

The scrapbook based science media project is a needs analysis in accordance with the existing curriculum and materials. The next stage of designing a scrapbook is creating a theme, table of contents, choosing photos and layout, cutting and pasting photos, creating pages, titles, writing and book decoration. The development stage is where the scrapbook will be assessed by media, language and material experts and improvements will be made. At the implementation stage, the scrapbook will be given to students as a test whether it is feasible or not after being checked by experts. This final stage carries out evaluation activities to measure the achievement of development goals. The evaluation results are used to provide feedback to users. Revisions are made according to evaluation results or needs that have not been met. The subjects in this research were all prospective teacher students in the PGSD study program at Al Muslim Bireun University. The samples of research were prospective teacher students in the PGSD study program, Science Media Products Course, even semester, academic year 2022/2023. The total research sample was 120 students which were divided into 4 unit groups, namely units B, C, D, E, with 30 people in each unit. The sampling technique used purposive sampling technique, which was a technique for determining samples with certain considerations . This research was carried out at Bireun Almuslim University, which

was one of the private universities in Aceh with the address Jala N Al-Muslim Matangg lumping two districts . Peusangan, Bireuen Regency . The instruments used in this research are observation sheets, questionnaires, interviews and documentation.

Expert Validation Analysis

The validation was carried out by 3 media experts, language experts, material experts and provided a validation sheet to the validator to obtain input and suggestions from the validator which had been prepared using a Likert scale.

Product Feasibility Data Analysis

Product data analysis is carried out to assess the entire appearance of the product to be developed. The validate the basic assumptions of the product idea, assist in idea development, estimate the potential market share of the product. The data obtained is then calculated using the formula:

$$P = \frac{f}{N} x\,100\%$$

Information:

P = Assessment Percentage

f = Score obtained

N = Overall score

Then the data is interpreted into table 1 as follows (Fauziyah et al., 2020) :

Table 1. Eligibility criteria

Presentation % e	Category
81 – 100%	Very worthy
61 – 80%	Worthy
41– 60%	Decent enough
21– 40 %	Not worth it

Data Analysis to Improve Design Skills

The next step after carrying out the research is to carry out a data normality analysis on obtaining data on improving students' design skills. This analysis aims to determine the level of normality of the samples that have been studied. The data

normality was tested using the Kolmogorov -Smirnov test. Kolmogorov-Smirnov test, if Sig > 0.05 (Normal) the data is tested with SPSS version 22.

To see the extent to which students' design skills have improved, the n-gain test is used . N -gain (normalized gain) is used to measure the increase in design skills between before and after learning. The score is done by calculating the difference between the pretest score (test before applying a certain method (treatment)) and the posttest score (test after applying a certain method (treatment)) (Oktavia et al., 2019) . These results are then calculated using the formula:

$$\text{N-Gain} = \frac{\%rerata\ keterampilan\ mendesain\ awal - \&rerata\ keterampilan\ mendesain\ akhir}{100\& - \%rerata\ keterampilan\ mendesain\ awal}$$

The calculation results using the formula above are then interpreted into the gain score (g) criteria category . The categories of gain score (g) criteria can be seen in Table 2 below:

Table 2. N-Gain Category

Gain Value	Category
g > 0.7	Tall
$0.3 \leq g \leq 0.7$	Currently
g < 0.3	Low

C. Result and Discussion

The developing of a scrapbook- based science media project, steps taken:

Firstly, a needs analysis is carried out in accordance with the existing curriculum and materials. The results of observations and interviews with students found that students lacked the ability to design a science media product for learning, so that prospective teacher students were required to be creative in designing learning media. The next stage of designing a scrapbook is creating a theme, table of contents, choosing photos and layout, cutting and pasting photos, creating pages, titles, writing and decoration of the scrapbook , then binding it in the shape of a book.

The development stage is where the scrapbook will be assessed by media, language and material experts and improvements will be made. Media, language and material validation is carried out by media, language and material expert lecturers. Experts are asked to fill out a validation questionnaire sheet by ticking the column

provided. Filling out the validation questionnaire aims to enable media experts or validators to provide an assessment of the product being developed. Furthermore, the validator also provides suggestions for improving the product being developed. After the validator provides suggestions, then revisions are made to the Scrapbook media. At the implementation stage, the scrapbook will be given to students as a test whether it is feasible or not after being deemed feasible by expert experts. The final stage carries out evaluation activities to measure the achievement of development goals. The evaluation results are used to provide feedback to users. Revisions are made according to evaluation results or needs that have not been met. The results of the scrapbook revision can be seen in Figure 1 below:

Figure 1. Initial *scrapbook design*

The result of the initial design of scrapbook science media, this process involves selecting the photos you want to include, arranging the photos, and adding decorative decorations. It was made by hand, the material was made in handwriting in a continuous upright form. The images and photos attached do not match the material required. The materials used were blank notebooks , scissors, pencils, erasers , glue , writing utensils , colored paper and decorative decorations. After that, they were given to material experts, media experts and language experts. The results of revision one can be seen in Figure 2 below:

Figure 2. Results of Revision 1 of the scrapbook science media project

The results of revision 1 used more prominent material text, the writing on the material was handwritten but the pictures and photos attached did not match what was required. The images presented are unrelated and do not support the

clarity of the material. Background that is not appropriate and does not have harmony between text and images. The results of revision II can be seen in Figure 3:

Figure 3. The Results of Revision II of the scrapbook science media project.

The scrapbook science media project that were developed are very suitable to be used, this is because the layout is attractive and neat, the used of images and photos is appropriate, the material presented is easy to understand, the color composition of the display is very attractive, the size of the letters is not too big or too large. small, describes the teaching material and the character of the object, the material presented is clear, the language used is in accordance with good and correct language rules (EYD), the order in which the material is presented is good.

The scrapbook media product developed has the following specifications: Scrapbook media is adapted to the material, namely measurements by showing pictures along with explanations, Scrapbook media is designed manually and then printed in book form.

The Expert Validation Analysis

Before testing the product on prospective elementary school teacher students, the results will be validated by experts or specialists, the product validation is carried out with language experts, media experts and material experts. Media experts assess the products was produced by providing scrapbook products and an assessment sheet in the form of a questionnaire containing 20 statements related to the product being developed. The following validation results from media experts, language experts and material experts are presented in Table 3:

Table 3. Results of Media Expert Validation Analysis

No	Rated aspect	Presentation	Information
1	Scrapbook media	82.26%	Very good
2	Technical quality *of* scrapbooking	89.05%	Very good

3	The physical size *of the* scrapbook	91.92%	Very good

Based on Table 3, the results of media expert analysis clearly show that every aspect has very good criteria. In the media aspect, the presentation value was 82.26%, so it was concluded that it was very good. In the technical quality aspect of the scrapbook, the presentation value was 89.05%, so it was concluded that it was very good. In terms of size, the scrapbook media has a presentation value of 91.92%, so it is concluded that it is very good. The scrapbooking is the art of sticking photos or drawings on paper media, and decorating them to become creative works. The scrapbooks was an attractive learning medium for students so the students concentrate more on learning. The results of research (Wardhani, 2018) concluded that scrapbooks from a linguistic perspective are very suitable to be used as learning media. For linguist analysis, see Table 4 below:

Table 4. The Linguist Expert Validation Analysis Results

No	Rated aspect	Presentation	Information
1	Straightforwardness	85.46%	Very good
2	Suitability to student development	89.75%	Very good
3	Conformity to language rules	92.32%	Very good

Based on Table 4, the results of media expert analysis clearly show that every aspect has very good criteria. In the aspect of language clarity, the presentation score was 85.46%, so it was concluded that it was very good. In the aspect of suitability for student development, the presentation score was 89.75%, so it was concluded to be very good. In the measurement aspect, conformity with language rules with a presentation value of 92.32%, so it is concluded to be very good. This is because the scrapbook uses language that is easy to understand, so the language in the scrapbook is the author's medium in conveying the story, the communication medium, and the language style used is appropriate. Indonesian language rules. The research results (Asih et al., 2020) concluded that linguistically, scrapbooks are very good for improving students' reading skills. For material expert analysis, see Table 5 below:

Table 5. The Material Expert Validation Analysis Results

No	Rated aspect	Presentation	Information
1	Material coverage	87.56%	Very good
2	Material accuracy	89.84%	Very good
3	Update	93.12%	Very good
4	Stimulates desire	90.44%	Very good
5	Media presentation	91.61%	Very good

Based on Table 5, the results of the material expert analysis clearly show that each aspect has very good criteria. In terms of material coverage, the presentation value was 87.56%, so it was concluded that it was very good. In terms of material accuracy, the presentation value was 89.84%, so it was concluded that it was very good. In the sophistication aspect, the presentation value is 93.12% so it is concluded to be very good. In the aspect of stimulating desire with a presentation value of 90.44%. In the aspect of media presentation, the presentation value was 91.61%, so it was concluded that it was very good. This is because the scrapbook contains memorabilia, narratives, quotes, stories, clippings, notes, photos, etc. , which are arranged and arranged in an album or hand - made book so that the material you want to convey is interesting to read. The results of research (Restian & Alfian, 2020) conclude that students are more focused in learning by using pictorial media, Abstract conditions in learning make it difficult for students to understand the material around in learning. So scrapbooks are a learning medium that can increase students' learning motivation

The Data Analysis of Product Feasibility

The product feasibility analysis was carried out by giving questionnaires to prospective elementary school teacher students. The results of the feasibility test can be seen in Table 6 below:

Table 6. The Feasibility Analysis Results

No	Aspect	Percentage	Information
1	Language rules	90.08%	Very Worth It
2	Media presentation	91.45%	Very Worth It

		3	Material suitability	90.11%	Very worthy

Based on Table 6, the results of the feasibility analysis clearly show that each aspect has very feasible criteria. In the aspect of coverage of language rules, the presentation value was 90.08%, so it was concluded to be very good. In the aspect of coverage of material presentation, the presentation value was 91.45%, so it was concluded that it was very feasible. In the coverage aspect, the conformity with the presentation value is 90.11%, so it is concluded that it is very feasible. This is because scrapbooks are two-dimensional media in the form of a book filled with pictures and then arranged more creatively and interestingly so that they can be used as learning media material. The research results of Muktadir, et al: 2020 concluded that scrapbooks can increase design creativity. Nurmala, et al: 2023 also expressed the same thing that scrapbooking can be implemented as an activity to improve design skills.

The Data Analysis to Improve Design Skills

Before carrying out the N-Gain test, the students' design skills test data will be carried out using a normality test. The following are the results of normality test calculations using the Kolmogorov-Smirnov test in detail, presented in table 4.7:

Table 4.7 The Calculation Results of the Kolmogorov-Smirnov Normality Test

A	Std. Dev	Variant	Sig.	Skewness	kurtosis	Mean
0.05	4.82	23.31	0.06	0.81	-0.91	11.99

Information:

* = Kolmogorov-Smirnov test, if Sig > 0.05 (Normal)

Based on the Kolmogorov-Smirnov test, the significant number is 0.06 > 0.05 , the design skills data follows a normal distribution.

Then a gain normality test was carried out to see how much value the students' design skills increased with scrapbook- based science media products. The N-gain results can be seen in table 7:

Table 7. The Results of Media Expert Validation Analysis

Treatment	Average value	N-Gain	Category
Pretest Value	65	0.81	Tall
Posttest value	95		

Based on the table of analysis results of the gain normality test, the result was 0.81, so it can be concluded that there has been an increase in the design skills of prospective elementary school teacher students in the high category. Obtaining test results for scrapbook- based science media products shows that this media is feasible and capable of improving the design skills of prospective elementary school teacher students. This is caused by scrapbook- based science media products using decorations in the form of pictures, photos and important notes that are interesting to students so that students concentrate more on learning. Several research results say that scrapbook- based science media products can increase science learning literacy (Wusqo et al., 2021) , increase learning motivation (Rambe et al., 2022) , improve student learning outcomes (LP Sari et al., 2019) , increasing creativity (Muktadir et al., 2020) . Proven scrapbook- based science media project able to make students understand abstract material or material that cannot be captured by the five senses . The use of learning media can attract students' attention, with the colors or shapes presented being able to introduce students' curiosity about the material presented.

D. Conclusion

The results of research by media experts clearly show that in the media aspect, the technical quality of the scrapbook and the size of the resulting media are very good. The linguist analysis clearly shows that language fluency, suitability for student development, and conformity to language rules are very good. The results of the material expert analysis clearly show that in terms of material coverage, material accuracy, up-to-dateness and stimulating desire, the media presentation is of very good value. Feasibility analysis clearly shows that the aspects of coverage of language rules, presentation of material, and coverage of conformity with grades are very good. The results of the normality gain test analysis showed a result of 0.81, so it can be concluded that there has been an increase in the design skills of prospective elementary school teacher students in the high category. This is because scrapbook-based science media products use decorations in the form of pictures, photos and important notes that are attractive to students so that students concentrate more on learning. The scrapbook- based science media products can improve science learning literacy.

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