QR Code Assisted Pop-Up Book for Grade Two Elementary Schools

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A B S T R A K

Pelaksanaan penelitian ini didasarkan pada terbatasnya materi yang tersedia pada buku siswa dan belum adanya dukungan untuk pop-up book berbantuan qr-code sehingga perlu dikembangkan media pembelajaran pada tingkat sekolah dasar. Tujuan penelitian ini ialah untuk menganalisis validitas dan kepraktisan media pop-up book berbantuan qr-code pada tema 8 subtema 2 kelas II sekolah dasar. Penelitian ini merupakan jenis penelitian pengembangan dengan menggunakan model ADDIE. Subjek uji coba dalam penelitian ini yaitu 3 ahli materi, 2 ahli media, 2 ahli praktisi dan 10 siswa. Metode kuesioner dipakai sebagai metode pengumpulan data pada penelitian ini. Instrumen yang digunakan adalah rating scale dengan skala lima. Data tersebut kemudian dianalisis dengan memakai rumus mean untuk menghitung rata-rata skor validitas dan kepraktisan media pop-up book. Rata-rata nilai validitas media pop-up book yang didapat sebesar 4,85 dengan tingkat yang sangat baik sesuai dengan hasil temuan. Sedangkan rata-rata kepraktisan media pop-up book yang didapat adalah 4,86 yang berada pada tingkat yang sangat baik. Berdasarkan analisis tersebut dapat disimpulkan bahwa media pop-up book yang dikembangkan berbantuan qr-code pada tema 8 subtema 2 dinyatakan valid dan praktis untuk digunakan dalam pembelajaran di kelas II sekolah dasar.

A B S T R A C T

The implementation of this research is based on the limited material available in student books and the absence of support for qr-code-assisted pop-up books, so it is necessary to develop learning media at the elementary school level. The purpose of this study was to analyze the validity and practicality of the qr-code-assisted pop-up book on theme 8 sub-theme 2 for grade II elementary school. This research is a type of development research using the ADDIE model. The test subjects in this study were 3 material experts, 2 media experts, 2 practitioner experts and 10 students. The questionnaire method was used as a data collection method in this study. The instrument used is a rating scale with a scale of five. The data was then analyzed using the mean formula to calculate the average validity and practicality score of the pop-up book media. The average value of the validity of the pop-up book media obtained is 4.85 with a very good level in accordance with the findings. While the average practicality of the pop-up book media obtained is 4.86 which is at a very good level. Based on this analysis, it can be concluded that the pop-up book media developed with the help of qr-code on theme 8 sub-theme 2 is valid and practical for use in learning in grade II elementary school.

1. INTRODUCTION

Education is essential in forming intelligent future generations and good character for a nation's progress (Humaeroh & Dewi, 2021; Sujana, 2019). The learning process must be done correctly for students to adjust the learning content. Since the primary responsibility of an educator is to teach, it is necessary to always be creative in producing new learning media that will enable students to achieve their learning goals in a meaningful way. Teachers and students will more easily interact with the help of learning media, so learning activities become more effective and efficient. Learning media can also foster student learning interest. Learning media has a vital function in the learning process, namely as a tool to

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assist teachers in simultaneously explaining messages to students (Abdullah, 2016; Hazmi, 2019; Pakpahan & Mawati, 2020). Learning media has an essential role in improving student achievement. Learning media includes things that can be used to build students' interests, abilities, and skills in learning activities (Maghfiroh & Suryana, 2021; Trisiana, 2020). The application of learning media makes it easier for students to digest the teacher's material in class, speed up the learning process, and create an effective learning environment (Handaruni Dewanti, Anselmus J E Toenlioe, 2018; Maghfiroh & Suryana, 2021). Learning becomes more relevant when students are directly involved in the learning process through operating the media. Media has specific goals: clarifying, facilitating, and creating topics that will be conveyed to students, fostering interest, and streamlining the learning process (Tafonao, 2018; Viora et al., 2021).

Based on the reality in the field, students are more interested in using illustrated teaching materials, as evidenced by the learning process of teachers who tend to use lecture style. Students become bored. Based on the results of the interviews that have been carried out, it is known that teachers are constrained to design and make media. It is due to the teacher's limited time. This limitation of media causes learning activities to only use learning media occasionally. In addition, it is known that the material that students can access in books still needs to be improved. Learning media is essential in learning activities because it can make learning more memorable and not repeated (Sentarik & Kusmariyatni, 2020; Uno et al., 2021). Learning media can help students build interest in learning, but it can affect student learning outcomes (Mediatati & Suryaningsih, 2017; Lestari et al., 2018).

The pop-up book is a type of learning media teachers can use in learning activities. Pop-up books are an innovative learning media where the book's contents can appear in 3 dimensions using a combination of rolls, twists, and folds (Elfiani et al., 2019; Mustofa & Syafi'ah, 2018). Each page in a Pop-up book can move when it is opened and contains illustrations with three-dimensional features on the page designed so students do not get bored when using or reading it (Diyantari et al., 2020; Mustika & Ain, 2020). This pop-up book is made as creative as possible to encourage students' interest in learning to improve their learning outcomes, especially in thematic learning (Hidayah et al., 2020; Masturah et al., 2018). Pop-up books can make it easier for teachers to display more concrete examples. Pop-up books have several advantages, including the ability to convey material accompanied by concrete examples in the form of pictures, which can be moved to attract students' interest and help students to remember it longer. Illustrations on pop-up books can make material concrete to clarify the material. It can provide a new experience for students in learning and can foster student interest. They create exciting learning that allows students to participate by operating the media (Anggraini & Efendi, 2022; Nazaruddin & Efendi, 2018).

In addition, pop-up books can make it easier for teachers to give concrete examples. Pop-up books are different from classic books. Namely, they have pages that can display images in a three-dimensional form that appear after the page is opened, and the images and objects are uneven. Thus, pop-up books are different from other books. Students will be motivated to learn (Colidiyah, 2018; Priscylio et al., 2020). The advantage of pop-up books is that they explain teaching material with pictures, are easy to carry anywhere, and help students remember material longer. The use of visual illustrations in pop-up books can be used to check student understanding. They provide learning experiences for students. It can foster students' interest in learning and make learning situations like playing so that students can participate in learning activities (Mustaqim et al., 2021; Ningtiyas et al., 2019). With an attractive shape, every page that appears, and attractive colors, pop-up book media can encourage students' interest to participate in learning and follow learning well (Alviolita & Huda, 2019; Sinta & Syofyan, 2021).

This research is supported by previous research, which states that pop-up book instructional media is appropriate for learning. It is known that based on the assessment of subject matter experts, a score of 95.8% is in an outstanding category, and from learning design experts, it is 88% in the same category. Well, as well as from learning media experts by 98.5% when used as learning media (Masturah et al., 2018). In addition, other studies have also conducted research by conducting trials, based on the results of small group trials and extensive group trials, which show that pop-up books fall into the category of "very good" and "appropriate" for use in learning process (Apriyanto & Hidayat, 2018). However, from previous research, no one has applied the QR code to pop-up books, and no pop-up book includes material on theme 8, sub-theme 2, grade II elementary school. On that basis, pop-up book development research was carried out to help increase students' understanding of the material provided. This study aimed to analyze the validity and practicality of QR-code-assisted pop-up books on theme eight, sub-theme 2 class II SD. Using a pop-up book assisted by a QR code can help the student learning process and improve student learning outcomes, especially in thematic learning.

2. METHOD

This research is a type of development research and uses the ADDIE development model. This model consists of five steps: analysis, design, development, implementation, and evaluation (Harjanta & Herlambang, 2018; Pratiwi et al., 2020; Setiadi & Yuwita, 2020). The decision to use this model is based on the fact that it has systematic and appropriate steps used to develop QR-code assisted pop-up books. This model is designed with a series of systematic activities to solve learning problems related to learning resources (Suyetno et al., 2020; Wisada et al., 2019). Due to limited time, workforce and funds, this research was conducted only at the analysis, design, and development stages, while the implementation and evaluation stages were not carried out. Products that have been developed are then tested for validity and practicality by experts, practitioners, and students. The suggestions and input obtained at the review stage are then used to improve the media that has been developed.

The test subjects in this study were 3 material experts, 2 media experts, 2 practitioners, and 10 students. This study uses two types of data, namely qualitative and quantitative data. The questionnaire method was used for collecting data in this study. This method is carried out by distributing statements or questions to be answered in writing by the respondents. Respondents' suggestions and contributions are also included in the answers. This study uses a rating scale instrument of 1: 5. Rating scale is an assessment using a specific scale from low to high (Ilhami & Rimantho, 2017; Wiyono et al., 2018). Media evaluation includes aspects of media validity, namely: aspects of cover, format, language content, practicality, and effectiveness. The instrument describes the six aspects according to each aspect's needs, such as media identity and cover appeal for cover elements. Color, text, font, and layout are all characteristics of the format. The content aspect includes factors such as the compatibility of the material with indicators, the ability of the media to present the material, the completeness of the content, and the attractiveness of the content contained in the media. The linguistic criteria include language, language norms, and the effectiveness of the use of sentences and words. One of the prerequisites for practical aspects is the use of media (Ramadayanty et al., 2021; Wiratama & Margunayasa, 2021). In order to collect good data, the instrument was tested for validity first with two judges, after which the findings were analyzed using the Gregory formula. The instrument grids used in the study are shown in Table 1, Table 2, and Table 3.

Table 1. Pop-Up Book Media Validation Sheet Grids for Material Experts

No.	Aspect	Indicator
1.	Content	Completeness of contents
		Content accuracy
		Content update
2.	Language	Compatibility of the material with the rules of the language
3.	Learning	Compatibility of material with student development
		The material is easy to understand
		Student engagement

(Modified from Damayanti et al., 2021)

Table 2. Pop-Up Book Media Validation Sheet Grid for Media Experts

No.	Aspect	Aspect
1.	The Interests of Media Forms	The attractiveness of media forms
2.	Appearance	Media shape and size
		cover view
		The suitability of colors and fonts on the media
		use of language
		Image quality
3.	Learning	Compatibility with the material
		Support the learning process

(Modified from Damayanti et al., 2021)

Table 3. Pop-Up Book Media Practicality Sheet Grids for Expert Practitioners

| No.	Aspek	Indikator
1.	Content eligibility	Completeness of contents
		Content accuracy
		Material update
2.	language eligibility	The use of language according to the rules of the language
3.	Physical attractiveness	Media form quality
4.	Appearance	Media shape and size
		cover view
		The suitability of colors and fonts on the media
		Image quality
		Accuracy with student development
5.	Learning	Can deliver material well
		Bring up student interaction
		Material linkage
		Material linkage

(Modified from Damayanti et al., 2021)

Based on the instrument validity test results, a score of 1.00 was obtained. Referring to the criteria for the coefficient of content validity of the instrument, it is known that the coefficient is in the range of 0.80-1.00, which is included in the very high criteria. It shows that this instrument is feasible to use. The data analysis method used in this study is a qualitative and quantitative descriptive analysis method. Scores, inputs, and suggestions obtained from the validity and practicality tests were analyzed using qualitative and quantitative descriptive analysis methods. The scores for the validity and practicality of the resulting media are averaged to determine the level of validity and practicality of the media being developed. After that, the average results were converted using five-scale conversion guidelines. The results of the assessment of the validity and practicality of the media are at least 3.0 x 4.0 with a good category so that the research can be said to be successful.

3. RESULT AND DISCUSSION

Result

This research aims to analyze the validity and practicality of QR-code-assisted pop-up books on theme eight, sub-theme 2 class II. This development uses the ADDIE model, which has five stages: the analyze, design, development, implementation, and evaluation. The analysis phase is the first step in this research. At this stage, curriculum analysis, needs analysis, student characteristics analysis, and media analysis are carried out. The design stage is carried out by designing pop-up book learning media, identifying material to be loaded on pop-up book media, and designing pop-up book designs using Photoshop CS5 software. Moreover, consulting supervisors to get feedback or suggestions so they can be improved. The pop-up book media prototype is presented in Figure 1.
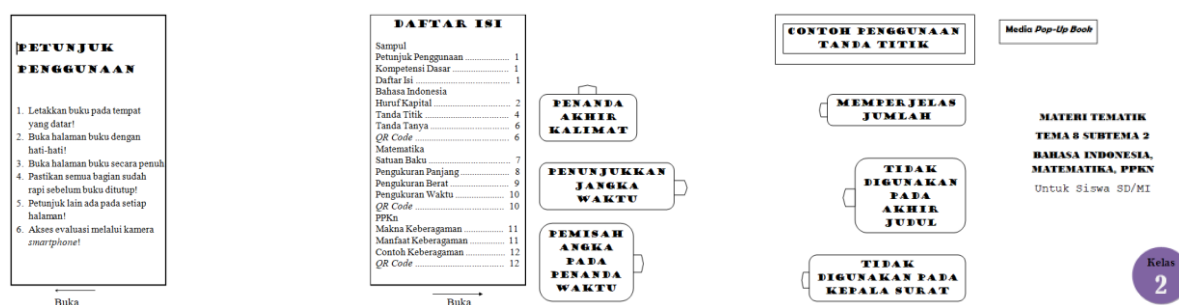
Figure 1. Prototype Media Pop-up Book

The development stage is carried out by developing pop-up book media referring to the designs prepared at the design stage and discussed with the supervisor. The developed pop-up book consists of several sections, including the cover section, instructions for using the media, table of contents, contents section, and evaluation. The appearance of the QR-code-based pop-up book media on the theme eight sub-themes 2 class II of the elementary school developed is presented in Figure 2.

Figure 2. Developed Pop-Up Book Media

After developing the pop-up book media, it is followed by product trials to determine the validity and practicality of the media that has been made. The validity test was carried out with three material experts and two media experts, followed by a practicality test with two teachers and ten grade II elementary school students. The validity test results of the QR-code assisted pop-up book media on theme eight sub-theme 2 class II elementary schools by material experts, and media experts are as follows. Based on the assessment given by the three material experts, an average score of 4.9 was obtained, which was included in the outstanding category. This category is obtained from the aspects assessed: material, language, and learning. Based on the assessment given by the two media experts, an average score of 4.8 was obtained, which was included in the outstanding category. This category is obtained from the aspects that are assessed, namely aspects of physical attractiveness, appearance aspects, and learning aspects.

Based on the responses given by the two homeroom teachers at SD Negeri 1 Penglatan and SD Negeri 2 Penglatan, an average score of 4.9 was obtained, which was included in the very good category. This category is obtained from the aspects that are assessed, namely material aspects, language aspects, learning aspects, physical attractiveness aspects, and appearance aspects. Meanwhile, based on the responses given by 10 grade II students, an average score of 4.82 was obtained, which was included in the very good category.

Discussion

Analyze phase, at this stage, .curriculum analysis, needs analysis, student characteristics analysis, and media analysis are carried out. Curriculum analysis is carried out by studying Core Competencies, Basic Competencies, and indicators contained in the book, which will be used as guidelines in developing pop-up book media. Needs analysis is carried out to analyze what teachers and students need during learning activities, especially on theme eight sub-themes 2. Teachers are given a questionnaire to fill in to carry out this needs analysis. Student characteristics were analyzed by analyzing the characteristics of elementary school students. Class II elementary school students are in the concrete operational stage. To understand the material provided at this stage, students need the help of concrete or natural objects for learning (Nurmalasari et al., 2022; Setyastuti et al., 2022). Pop-up book media can be classified as concrete objects or tangible objects. Using natural objects is very important in the learning process to help students understand the material. Good media analysis is carried out to analyze the characteristics of suitable media.

The design stage is the stage for realizing the results of the previous analysis (Ayunda & Fitria, 2022; Samad et al., 2022). At this stage, the design of pop-up book media is carried out by determining the material to be presented, namely material on theme 8, safety at home and travel, and sub-theme 2, maintaining safety at home. Then proceed with making a media design. A media design is made to find out the description of the position of each section on the pop-up book media. The media design consists of covers, instructions for use, a table of contents, sections of contents, and an evaluation in the form of a QR code. Then make a design, making the design aims to beautify the appearance of the media and describe the material being discussed. Designing a design in Photoshop CS5 is the first step in media creation. To the characteristics of elementary school students, media covers are developed with attractive color compositions. The next page will be equipped with instructions for using the media and a table of contents. Pop-up books contain interesting pictures embedded in a three-dimensional shape on each page that appear to lift and move when the page is opened. This pop-up book also contains a QR code at the end of the material. If the QR code is scanned, an evaluation will appear the student will carry that out. It is an innovation in pop-up book media. Furthermore, the printed Pop-up book is assembled manually. The pop-

up book size is 16.5cm x 22cm and includes 13 pages. Pop-up books are assembled using tools and materials commonly used daily, such as scissors, cutters, double-sided foam tape, glossy paper, and art paper.

Students' interest or desire to learn can be stimulated by utilizing learning media in learning activities. It is predicted that students' interest in learning will increase due to the use of effective learning media (Ernawati, 2020; Mashuri & Budiyono, 2020). Referring to the assessments obtained from material and media experts, the average media validity score was 4.85 in the outstanding category. Based on the results of these calculations, the QR-code assisted pop-up book media on theme eight sub-theme 2 class II elementary school is declared valid with an outstanding category. Hence, it is suitable for use in the learning process. Students' interest or desire to learn can be stimulated by applying learning media in the learning process. Learning media development must be carried out by adjusting the needs and development of students. The problem now is to develop learning media that are interesting, practical, and informative but must still adapt to the needs of students. *The pop-up book* is a medium that answers this challenge. Pop-up books contain embossed images or three-dimensional aspects that can present more exciting material, and contain images that move when the page is opened (Asnanda et al., 2021; Sahara & Silalahi, 2022).

This pop-up book is made as creative as possible to encourage students' motivation to learn to improve their learning outcomes, especially in thematic learning. Pop-up books will also assist teachers in student learning activities by making it easier to include more concrete examples (Hidayah et al., 2020; Nikmah et al., 2019; Ningtiyas et al., 2019). There are several types of pop-up book displays, such as transformations which are types of displays arranged vertically. Volvelles is a type of look that incorporates circular elements in its design. A *peepshow* is a display of stacks of paper stacked on top of one another to give a sense of depth and perspective. A pull tab is a paper shape or sliding tab that can be pulled out and pushed to give a pop-up book a new look. Carousel, this technique is supported by rope, ribbon, or buttons, which, once opened and folded, can be complex. Box and cylinder is a cube or tube movement that rises from the center of the page when the page is opened (Rahmatilah et al., 2017; Rizkiyah, 2019).

In developing pop-up book learning media assisted by QR code on theme eight sub-theme 2, the researcher used the transformations and pulled tabs techniques. The advantage of pop-up book media is that it can give students a unique experience by requiring them to pull, open, and fold pieces of pop-up books (Habibi & Setyaningtyas, 2021; Putri et al., 2019). It can have a lasting impact on readers, making it easier to remember when using this medium. Using pop-up books in the learning process will provide many benefits, especially for students. Because besides being able to stimulate students' interest in learning, pop-up book media can provide new learning experiences (Khoiriyah & Sari, 2018; Suherman et al., 2021). This study has several differences and advantages from previous research. So far, this is the first time anyone has used a QR code in the evaluation section. This QR code will make it easier for teachers and students to evaluate. After students work on the evaluation in the QR code, the value will immediately come out, and students can see which answers are right and wrong. The value will be directly stored in the system so that it will not be scattered and lost. In addition, no one has developed pop-up book media on theme eight, sub-theme 2. This research implies that it can foster students' motivation to learn and help them understand the material to improve their learning outcomes. It is recommended that teachers use pop-up book media in the learning process to help increase student interest in learning and make learning material easier to understand.

4. CONCLUSION

The QR-code-assisted pop-up book media on theme eight sub-theme 2 class II elementary school is declared valid and practical to be suitable for learning in class II elementary school. By displaying images that look more dimensional, the pop-up book media developed presents a unique visualization and makes the book more meaningful. The use of pop-up book media that displays an accurate picture of a material can increase students' understanding and interest in learning to improve student learning outcomes.

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