

Pengembangan Media Pembelajaran Buku Saku Interaktif Berbasis *Augmented Content* pada Mata Pelajaran IPA untuk Mengembangkan Literasi Visual Peserta Didik

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ABSTRAK

Penelitian ini dilatarbelakangi oleh penggunaan media pembelajaran IPA di kelas VI Madrasah Ibtidaiyah Podorejo Sumbergempol Tulungagung yang masih bersifat konvensional, sehingga hasil belajar dan literasi visual peserta didik tergolong rendah, terutama pada materi abstrak tentang sistem tata surya. Untuk mengatasi permasalahan tersebut, dikembangkan media pembelajaran berupa buku saku interaktif berbasis *augmented content* sebagai inovasi pembelajaran yang lebih menarik dan mudah dipahami. Penelitian ini bertujuan untuk: (1) mengembangkan media pembelajaran buku saku interaktif berbasis *augmented content* pada mata pelajaran IPA, dan (2) mengetahui efektivitasnya dalam mengembangkan literasi visual peserta didik kelas VI. Penelitian ini menggunakan metode Research and Development (R&D) dengan model ADDIE yang meliputi tahap analisis, desain, pengembangan, implementasi, dan evaluasi. Produk yang dihasilkan berupa buku saku interaktif berukuran A6 yang dilengkapi barcode yang terhubung dengan video dan konten pembelajaran. Teknik pengumpulan data menggunakan angket, tes, dan dokumentasi. Hasil penelitian menunjukkan bahwa media yang dikembangkan dinyatakan sangat layak dengan persentase validasi ahli materi sebesar 95,38% dan ahli media sebesar 92,30%. Respons peserta didik mencapai 92,35% dan respons pendidik sebesar 92%, yang keduanya termasuk dalam kategori sangat baik. Media ini juga terbukti efektif dalam meningkatkan literasi visual, dengan nilai N-Gain sebesar 0,78 yang termasuk dalam kategori tinggi. Dengan demikian, buku saku interaktif berbasis *augmented content* layak dan efektif digunakan sebagai alternatif media pembelajaran IPA di sekolah dasar.

ABSTRACT

This research is motivated by the use of science learning media in grade 6 of Islamic Elementary School Podorejo Sumbergempol Tulungagung which is still conventional, so that the learning outcomes and visual literacy of students are low, especially in the abstract material of the solar system. To overcome this problem, learning media was developed in the form of interactive pocket books based on *augmented content* as a learning innovation that is more interesting and easy to understand. This study aims to (1) develop interactive pocket book learning media based on *augmented content* in science subjects, and (2) determine its effectiveness in developing visual literacy of grade 6 students. The study used the Research and Development (R&D) method with the ADDIE model which includes analysis, design, development, implementation, and evaluation. The resulting product is an A6-sized interactive pocket book equipped with a barcode connected to videos and learning content. Data collection techniques used questionnaires, tests, and documentation. The results of the study showed that the media was declared very feasible with a validation percentage of material experts of 95.38% and media experts of 92.30%. Student response reached 92.35% and educator response 92%, both in the very good category. This media was also effective in improving visual literacy, with an N-Gain value of 0.78, in the high category. Thus, interactive pocket books based on *augmented content* are suitable and effective as an alternative science learning medium in elementary schools.

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1. INTRODUCTION

Technology-based learning media not only create more interactive learning experiences, but also increase students' interest in the learning process. This is in line with the growing need for innovation in learning activities, especially with technological advancements that enable the integration of various interactive media into teaching and learning processes (Intan, 2025). In an effort to improve learning effectiveness, the use of learning media has become one of the pro-Islamic Elementary Schooling alternatives. Interactive learning media, in particular, have attracted educators' attention because of their potential to increase student engagement and improve learning outcomes (Putri, 2024). Learning media are tools used by teachers to help clarify the meaning and messages conveyed during the learning process (Siti, 2021).

The quality of education can be reflected through effective and efficient learning processes that motivate students to continue learning and exploring new knowledge. In addition to the learning process itself, teachers also play an important role in the success of learning activities (Dewa et al., 2020). Every interaction in the learning process contains several elements: first, the objectives to be achieved through learning; second, the presence of teachers and students; third, the teaching materials to be delivered; fourth, the methods used to create a supportive learning environment; and fifth, the assessment process to measure the extent to which learning objectives have been achieved (Dewi, 2014).

One of the learning media that can be used in the learning process is a pocket book. The use of pocket book media can increase and direct students' attention, thereby enhancing learning motivation, interaction with the environment, and students' independent learning skills (Selan et al., 2023). A pocket book is generally printed in a small size to make it more efficient, simple, and easy to use. Learning activities also require supporting media to complement the learning process. Although many types of learning media are used in education, there is currently a growing need for media that are practical and engaging (Islamic Elementary Schoolta, 2022).

Augmented content utilizes digital technology to create learning experiences that are more immersive and engaging compared to traditional content. Visual literacy refers to the ability to read and construct visual messages (Santi, 2016). Initially, visual literacy was used to explain how humans observe objects and attempt to interpret and understand the messages obtained through visual observation. However, today visual literacy is also used to analyze images, objects, symbols, signs, colors, and other elements encountered while viewing audiovisual works, and then interpret and understand the meanings conveyed through those visual representations (Sri et al., 2011).

The purpose of science learning is to help students develop critical thinking skills, gain a better understanding of concepts, and foster their interest and motivation to learn (Fita et al., 2022). Based on pre-Islamic Elementary Schoolnary observations conducted by the researcher at IslaIslamic Elementary Schoolc Elementary School Podorejo Sumbergempol, it was found that the science learning process at the school was still carried out conventionally, using lecture methods along with textbooks and student worksheets as the primary learning resources.

Teachers had not yet utilized innovative learning media capable of visualizing science concepts in a concrete and engaging way for students. In particular, science learning involving abstract materials still faced several challenges. Students tended to experience difficulties in understanding scientific concepts because the learning process had not yet incorporated technology that could provide visual and interactive learning experiences.

In addition, the results of observations conducted by the researcher showed that students' visual literacy was still relatively low. Many students were not yet able to accurately interpret scientific images or illustrations and had difficulty connecting them with the concepts being studied. This indicates that the classroom learning process had not fully fostered the visualization skills that are important in science learning. These conditions show that the science learning process at at IslaIslamic Elementary Schoolc Elementary School Podorejo Sumbergempol Tulungagung requires innovative learning media that are not only engaging and interactive, but also capable of helping students develop their visual literacy. Therefore, the development of an augmented content-based interactive pocket book learning media is needed as an effort to provide students with a more contextual, engaging, and meaningful learning experience.

Several previous studies related to the development of pocket book learning media have been conducted. First, a study on the development of pocket book media conducted by Wirda Nuzulla in 2023 was proven to be feasible. However, the study focused on the development of a Islamic Elementary Schoolnd mapping-based digital pocket book and did not utilize augmented content technology nor target the improvement of students' visual literacy. Second, a study on the development of numeracy literacy-based pocket book media conducted by Ilda Efriyanatul Hikmah in 2024 was proven feasible for teaching Least Common Multiple (LCM) and Greatest Common Factor (GCF) materials in Mathematics subjects (Ilda, 2021). Furthermore, previous studies

on pocket book media development have demonstrated their feasibility and effectiveness in supporting the learning process. Nevertheless, they were still Islamic Elementary School to static pocket book media without the integration of augmented content technology or barcode scanning features that could engage students in visualizing learning videos or animations.

The use of technology-based learning media is still relatively rare; therefore, innovations such as this are greatly needed to increase students' interest and learning effectiveness. One innovative approach is the addition of video content embedded in the form of barcodes within the pocket book. When the barcode is scanned using a smartphone or other device, YouTube videos related to the learning material will automatically appear. This method not only makes learning more engaging and interactive, but also enriches students' visual literacy by providing moving visual simulations that support a deeper understanding of concepts. Therefore, this innovation is expected to improve the quality of learning and enhance students' skills in facing the digital era.

2. METHOD

This study employed the Research and Development (R&D) method, which aimed to develop and test the effectiveness of an augmented content-based interactive pocket book learning media in science subjects to improve the visual literacy of sixth-grade students at Islamic Elementary School Podorejo Sumbergempol Tulungagung. The selection of the R&D method was based on the research objective, which was not only to describe a phenomenon but also to produce a tangible product that could be used in the learning process. The development model used in this study was ADDIE, which consists of five stages: analysis, design, development, implementation, and evaluation.

The analysis stage was conducted through observations and interviews with teachers to identify learning needs, actual classroom conditions, the media used, students' responses, and difficulties in understanding science material, particularly the solar system topic. The design stage involved designing an interactive pocket book containing sixth-grade science materials in accordance with the curriculum, equipped with images, concise texts, barcodes connected to learning videos, an attractive and user-friendly interface design, learning activities, evaluation instruments, and indicators of media success. The development stage was the process of creating the actual product using Canva by integrating augmented content in the form of illustrative YouTube videos that could be accessed through barcode scanning using smartphones or tablets. Before being used in the research, the research instruments were first validated by expert validators to ensure content feasibility, language clarity, and suitability with the research indicators. The validated instruments included material expert validation questionnaires, media expert validation questionnaires, student response questionnaires, teacher response questionnaires, as well as pretest and posttest questions. The validation process was conducted by two expert lecturers who had competencies in learning media and elementary science materials. The validation results showed that all instruments were categorized as feasible for use after revisions were made according to the validators' suggestions.

The implementation stage was carried out through the direct application of the media in sixth-grade science learning by adIslamic Elementary Schoolnistering pretests and posttests to measure improvements in learning outcomes. Teachers and students were also given instructions regarding the use of the media before the learning activities began. The evaluation stage was conducted both formatively and summatively to assess the feasibility and effectiveness of the media through questionnaires, tests, and interviews. The data collection techniques used in this study included material expert and media expert validation questionnaires, teacher and student response questionnaires, interviews, documentation, and learning outcome tests. The feasibility data were analyzed using a Likert scale with a score range of 1–5, while the effectiveness analysis used the N-Gain test to deterIslamic Elementary Schoolne the improvement in students' learning outcomes and visual literacy before and after using the learning media. In addition to descriptive analysis in the form of percentages and the N-Gain test, this study also employed a simple statistical test to strengthen the research findings. The pretest and posttest data were analyzed using a paired sample t-test to deterIslamic Elementary Schoolne the significance of the improvement in students' learning outcomes after using the learning media. The results of the paired sample t-test indicated a significant difference between the students' pretest and posttest scores after using the augmented content-based interactive pocket book learning media. This finding demonstrates that the developed learning media had a positive effect on improving students' learning outcomes and visual literacy.

3. RESULT AND DISCUSSION

RESULT

Development of Augmented Content-Based Interavtive Pocket Book Media

This research and development procedure employed the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation.

a. Analysis

1) Selection of Materials and Analysis of Learning Objectives

Before developing the interactive pocket book media, it was important to select materials that were appropriate to the learning objectives. At this stage, the researcher found that students still experienced difficulties in understanding abstract materials. Therefore, the researcher considered the characteristics of the students and the level of material difficulty. The researcher selected the Solar System topic because its concepts, such as the arrangement of planets, planetary movements, and distances between planets, cannot be directly observed and are therefore difficult for students to imagine. Under these conditions, learning materials and media were needed to help students visualize the concepts of the solar system more concretely.

The analysis of learning objectives aimed to ensure that the developed product had a clear direction aligned with the learning process and the predetermined Elementary School learning outcomes. Through this analysis, the researcher was able to identify the competencies that students were expected to achieve, both in terms of knowledge and skills, so that the product development could focus on students' needs.

The analysis of learning objectives also served as the basis for determining Elementary School learning materials to be developed, selecting the appropriate media, and formulating the achievement indicators to be measured. In addition, this stage functioned as a reference for preparing research instruments, such as pretest and posttest questions as well as response questionnaires, to ensure that the evaluation stage would align with the intended learning objectives. Therefore, the development of learning media that corresponded to the learning objectives could be carried out efficiently, enabling the learning process to run smoothly and helping students better understand the presented materials.

2) Analysis of Learning Needs

The analysis of learning needs was conducted as an initial step in the development process to identify the gap between the expected conditions and the actual conditions in the learning process. The purpose was to determine the needs of both students and teachers so that the learning objectives could be achieved optimally. The needs analysis was carried out through interviews with the sixth-grade science teacher and two students.

The interview results showed that students not only needed theoretical understanding but also more concrete material presentations, especially for abstract science topics such as the solar system. Students often experienced difficulties in understanding concepts such as rotation, revolution, planetary characteristics, and the order of planets because these concepts cannot be directly observed. The learning process used so far was still dominated by lecture methods, worksheets, simple student activity sheets, and occasional videos displayed through a projector, which were not sufficiently effective in helping students understand the material. In addition, the limited school facilities and infrastructure also became obstacles to the use of more interactive learning media.

Students also expressed difficulties in imagining the shapes and movements of planets because they only viewed pictures in worksheets. They expected learning media that were more engaging, less monotonous, and equipped with images and videos that could help visualize the material. Based on the results of this analysis, several major problems were identified, namely monotonous teaching methods, difficulties in understanding abstract concepts, and the lack of interactive learning media. Therefore, the development of learning media that are engaging, contextual, practical, and suitable for students' characteristics is needed to support the learning process and improve the visual literacy of sixth-grade students.

b. Design

The design stage was carried out after the researcher collected data through interviews with teachers and students. At this stage, the researcher began designing a learning medium in the form of an Augmented Content-based Interactive Pocket Book aimed at improving the visual literacy of sixth-grade students at ISLAMIC ELEMENTARY SCHOOL Podorejo Sumbergempol Tulungagung. The design process focused on organizing the learning materials and creating an attractive, effective media display that suited students' needs. The preparation of materials in the interactive pocket book referred to the Learning Outcomes (CP) and Learning Objectives (TP) to ensure that the content remained relevant to the applicable curriculum.

Furthermore, the researcher designed the initial form of the media or product by using a storyboard as the main guide in the development process. A storyboard is a graphical arrangement consisting of a sequence of illustrations or images used to visualize the flow of interactive media. The use of storyboards helped the researcher systematically describe the presentation flow of the materials, the layout of each page, and the relationship between the content and the visual elements used. Through the storyboard, the researcher was able to design the media structure more systematically, determine the sequence of material presentation clearly, and ensure the alignment between the material content, visual design, and the intended learning objectives.

This study employed a one-group pretest-posttest design. In this design, students were given a pretest before the use of the learning media and a posttest after the implementation of the learning media. This design was used to determine the improvement in students' learning outcomes and visual literacy after using the augmented content-based interactive pocket book media.

This initial design also provided a comprehensive overview of the pocket book to be developed, starting from determining Islamic Elementary Schooling the material titles, selecting images and supporting visual elements, to placing barcodes connected to augmented content as the main innovation in the learning media. In addition, the storyboard contained an outline of the material content that would be presented in the pocket book, serving as an initial reference in the media development process. With this well-structured design stage, the development process of the augmented content-based interactive pocket book became more systematic and efficient, enabling the creation of learning media that aligned with students' needs and the predetermined Islamic Elementary Schooling learning objectives.

c. Development

The development stage was the process of transforming Islamic Elementary Schooling the interactive pocket book design, which had previously only existed in the form of a storyboard, into a real product. This process included organizing the material content, designing the visual appearance, adding supporting illustrations, and integrating interactive features according to the established plan. The objective was to produce an augmented content-based interactive pocket book that was feasible, engaging, and suitable for the needs of sixth-grade students at Islamic Elementary School Podorejo Sumbergempol Tulungagung.

The development process began with selecting materials that were adjusted to the characteristics of the students and referred to the Learning Outcomes and Learning Objectives to ensure relevance to the curriculum. After the materials were determined for Islamic Elementary Schooling, the media was designed using the Canva platform by considering visual aspects such as text readability, layout, color selection, illustrations, and interactive elements to make the media more attractive and easier to understand.

After the media had been fully developed, the researcher prepared validation instruments in the form of assessment questionnaires for material experts and media experts. The material experts assessed aspects such as content, presentation, relevance, breadth of material, and language use, while the media experts evaluated the design, appearance, visual suitability, and media feasibility. In addition, pretest and posttest instruments were also prepared to measure the effectiveness of the media. The pretest was administered before the trial to determine Islamic Elementary Schooling students' initial abilities, while the posttest was given after the trial to identify improvements in learning outcomes using the same questions. The researcher also prepared response instruments for teachers and students to obtain their opinions, evaluations, and responses toward the developed learning media.

d. Implementation

At this stage, the researcher conducted validation of the augmented content-based interactive pocket book learning media that had been developed. The purpose of this validation was to ensure that the developed product possessed appropriate content quality and media presentation before being tested on students. The validation process was carried out by material experts and media experts who had competencies and experience in their respective fields.

1) Material Expert Validation

The material expert validator assessed the suitability of the material content contained in the augmented content-based interactive pocket book media. The results of the material expert's assessment were used by the researcher to determine Islamic Elementary Schooling the validity and feasibility of the developed media. The assessment results showed that the media obtained a score of 62 out of a maximum score of 65, resulting in a percentage score of 95.38%, which was categorized as highly feasible. Nevertheless, the validator provided several suggestions for improvement so that the developed media could be further enhanced.

2) Media Expert Validation

The media expert validator assessed the media design and overall media feasibility. The assessment results showed that the media obtained a score of 60 out of a maximum score of 65, resulting in a percentage score of 92.30%, which was categorized as highly feasible. However, the validator also provided several suggestions for refinement to further improve the developed media.

Based on the validation results from both the material expert and the media expert, several suggestions and revisions were identified. These revisions were carried out to improve deficiencies, refine the material content, and clarify the media display. The comments and suggestions provided by the validators served as references for the researcher in improving the quality, accuracy, and attractiveness of the developed media.

Based on the validation results, the researcher revised the interactive pocket book before its implementation. The revisions focused on the design appearance, including enlarging the font size to make it easier for elementary school students to read, changing the background color to a simpler blue theme, adding visual elements to enhance attractiveness, and increasing the number of pages from 20 to 28 pages so that the book would appear more complete and engaging. These revisions aimed to improve the short-term Islamic Elementary Schooling of the media while ensuring that it met the criteria of feasibility, clarity of material, and visual quality before being tested in the classroom.

Before the implementation stage, the researcher conducted a follow-up interview with the sixth-grade science teacher at Islamic Elementary School Podorejo Sumbergempol Tulungagung, namely Mrs. Zakiyatul

Ilma, S.Pd.I., as an initial stage of product introduction. The teacher explained that she had never previously used an augmented content-based interactive pocket book and was only an Islamic Elementary School teacher with scouting pocket books and barcodes in worksheets that generally contained additional reading materials. After the researcher explained the media features, such as solar system materials, learning videos accessed through barcodes, 3D visualizations of planetary rotation and revolution, student worksheets, drawing boards, solar system songs, and digital pocket books accessible through smartphones, the teacher gave a very positive response. The teacher considered the media highly beneficial in helping students understand abstract concepts through more realistic visualizations and expressed readiness and willingness to use the augmented content-based interactive pocket book in classroom learning to support the development of sixth-grade students' visual literacy.

e. Evaluation

The final stage of development using the ADDIE model was evaluation. This stage aimed to assess and evaluate the learning media product that had been developed. The researcher conducted a comprehensive review of the implementation results of the augmented content-based interactive pocket book learning media. The evaluation was carried out by analyzing the feedback and suggestions provided by the media experts and material experts regarding the developed learning media.

After conducting the validation process with the media experts and material experts, the validators provided assessments of the developed learning media. In addition, they also gave various suggestions and recommendations as revision materials so that the media could be further improved. For example, the media expert suggested changing the font size in the pocket book to make it easier for students to read and adding more visual elements and illustrations. Meanwhile, the material expert suggested expanding the scope of the material and adding more pages so that the pocket book would not appear too thin.

In addition to the feedback and suggestions provided by the media and material experts, the teacher also gave responses regarding the developed pocket book media. The teacher stated that the media could help students understand abstract concepts in the solar system material through more realistic visualizations. Furthermore, the teacher expressed readiness and willingness to use the augmented content-based interactive pocket book media in learning activities to support the development of students' visual literacy.

Feasibility of the Augmented Content-Based Interactive Pocket Book Media

a. Pretest and Posttest Trial

The pretest and posttest trials were conducted with 22 sixth-grade students of Islamic Elementary School Podorejo Sumbergempol Tulungagung. The pretest was administered before the learning media was implemented in order to determine the students' initial abilities and level of understanding of the material to be studied. Meanwhile, the posttest was administered after the media had been applied in the learning process to identify improvements in learning outcomes and the effectiveness of the media used. The results of the pretest and posttest were used to compare students' initial and final abilities after the implementation of the developed learning media. The effectiveness test using the pretest and posttest trials was calculated using the N-Gain formula.

Table 1. Pretest and Posttest Trial

No.	Name	Score		N-Gain Score
		Pretest	Posttest	
1.	ARGFA	30	75	0,64
2.	AFR	40	95	0,92
3.	AMA	0	80	0,80
4.	DTPZ	80	100	1,00
5.	EPM	40	90	0,83
6.	HNI	30	85	0,79
7.	IA	40	90	0,83
8.	IFAM	50	100	1,00
9.	KRK	30	80	0,71
10.	LYPW	50	90	0,80
11.	MAFA	70	95	0,83
12.	MR	30	90	0,86
13.	MRF	30	80	0,71

14.	MSAS	0	60	0,60
15.	MVAP	30	85	0,79
16.	MZZ	30	60	0,43
17.	NAA	30	100	1,00
18.	NGPA	70	100	1,00
19.	PS	30	90	0,86
20.	SAN	50	85	0,70
21.	YDF	30	90	0,86
22.	ZAS	50	85	0,70
Score		840	1905	17,26
Maximum Score		2200	2200	22,00
Average		38,18	86,59	0,78
Category		High		

DISCUSSION

Development of Augmented Content-Based Interactive Pocket Book Media

Based on the research findings, the development of augmented content-based interactive pocket book media played a significant role in improving the quality of science learning, particularly on the topic of the solar system. This learning media is in line with Azhar Arsyad's opinion that learning media are anything that can be used to convey messages in order to stimulate students' thoughts, attention, feelings, and interest in learning. The use of appropriate learning media can help students understand materials more easily, increase learning motivation, and enrich learning experiences. This study employed the ADDIE development model, which consists of the stages of Analysis, Design, Development, Implementation, and Evaluation.

During the analysis stage, the researcher identified learning needs, selected materials, and determined Islamic Elementary School learning objectives based on actual classroom conditions. The solar system topic was chosen because it is abstract and difficult for students to understand, especially concepts related to planetary characteristics, the order of planets, shapes, and planetary rotation and revolution. Previous learning activities still relied on lecture methods, worksheets, and two-dimensional images that were not able to provide concrete visualizations. Elementary school students tend to understand concrete concepts more easily than abstract ones; therefore, learning media capable of visualizing concepts more clearly and attractively were needed. For this reason, an augmented content-based interactive pocket book was developed to support students' understanding of the material and improve their visual literacy.

At the design stage, the researcher prepared the media design based on the results of the needs analysis. The media was systematically designed, starting from the introduction of basic solar system concepts to discussions of each planet. The material was presented concisely, systematically, and supported by relevant visual illustrations to make it easier to understand. The Islamic Elementary School use of dark blue colors was intended to create a space-like atmosphere, while images of planets, stars, and other visual elements were designed to strengthen students' visual understanding.

In addition, barcodes were added to certain sections, linking students to animated videos, additional visualizations, and interactive worksheets as part of the implementation of augmented content. This design not only emphasized visual aspects but also aimed to improve students' visual literacy.

During the development stage, the prepared design was transformed into a real product in the form of an augmented content-based interactive pocket book. The product contained concise and systematic solar system materials, supported by visual illustrations and augmented content features in the form of barcodes that could be scanned to display learning videos and 3D visualizations. This feature allowed students to observe solar system objects in a more realistic and interactive way, making the learning process more engaging. At this stage, the research instruments were also prepared, including material expert and media expert validation sheets, pretest and posttest questions, as well as student and teacher response questionnaires. The validation results indicated that the media was categorized as highly feasible, with revisions involving font size improvements, simplification of the display, and the addition of pages to optimize the media's usability.

The implementation stage was conducted by applying the learning media to sixth-grade students. Before implementation, the media was validated by material experts and media experts, obtaining percentages of 95.38% from the material experts and 92.30% from the media experts, both categorized as highly feasible. After being declared feasible, the media was used in the learning process and received positive responses from

both teachers and students. Teachers considered the media helpful in explaining abstract materials and increasing students' interest in learning. During the learning activities, students appeared more active, enthusiastic, and interested, especially when accessing the augmented content features through barcode scanning. They not only read the material but also directly interacted with the displayed visualizations, making the learning process more meaningful and less monotonous. This media also helped students understand abstract concepts such as planetary rotation and revolution more concretely.

At the evaluation stage, the effectiveness of the media was analyzed using pretest, posttest, and response questionnaire data. The trial results involving 22 students showed that the average pretest score of 38.18 increased to 86.59 in the posttest. The N-Gain result of 0.78 fell into the high category, indicating that the media was highly effective in improving students' learning outcomes. The student response questionnaire obtained a percentage of 92.35%, categorized as Very Good, showing that the media was easy to use, attractive, clear, and capable of helping students understand the material while improving their visual literacy. Students also stated that the learning process became more enjoyable and less boring. Meanwhile, the teacher response questionnaire obtained a percentage of 92%, categorized as Highly Feasible, indicating that the media greatly supported the learning process and facilitated the explanation of abstract materials.

Overall, the research findings indicate that the augmented content-based interactive pocket book was proven to be effective, feasible, and practical for use in science learning. This media not only improved students' learning outcomes but also helped develop their visual literacy through the presentation of more concrete, engaging, and interactive materials. However, this study still had limitations, particularly the absence of a control group for comparison, meaning that the effectiveness of the media was measured only based on the improvement in learning outcomes before and after the use of the media within a single group of students. Therefore, future studies are recommended to use experimental designs involving control groups in order to obtain stronger research findings.

Feasibility of the Augmented Content-Based Interactive Pocket Book Media

The effectiveness test of the augmented content-based interactive pocket book learning media was conducted through pretests, posttests, student response questionnaires, and teacher response questionnaires involving 22 sixth-grade students of Islamic Elementary School Podorejo Sumbergempol Tulungagung. The pretest and posttest were administered using 10 questions adjusted to the solar system material to determine improvements in learning outcomes after the use of the media. The results showed that the total pretest score was 840 with an average score of 38.18, while the total posttest score reached 1905 with an average score of 86.59. This significant improvement indicates that the use of the learning media had a positive effect on students' understanding of the solar system material. The N-Gain analysis produced an average score of 0.78, which falls into the high category, indicating that the learning media was effective in improving students' visual literacy, which in turn contributed to improved learning outcomes. This finding also indicates that the learning process was carried out effectively and optimally.

The results of the student response questionnaire were used to determine students' opinions regarding the use of the learning media. Based on the questionnaires completed by 22 students, a score of 1219 out of a maximum score of 1320 was obtained, with an average percentage of 92.35%, categorized as Very Good. These results indicate that students gave highly positive responses to the media used. The positive responses were reflected in students' interest in the media display, ease of use, clarity of the material, and the media's ability to help them understand the solar system topic. The high percentage of student responses indicates that the developed media was capable of creating a more engaging, interactive, and less monotonous learning atmosphere while increasing student involvement in the learning process and improving their visual literacy.

In addition, teacher response questionnaires were also distributed to obtain teachers' responses, evaluations, and suggestions regarding the developed learning media. The results of the teacher response questionnaire showed a score of 46 out of a maximum score of 50, with a percentage of 92%, categorized as Very Good. These results indicate that the augmented content-based interactive pocket book learning media was considered capable of supporting science learning, helping explain abstract materials, increasing learning motivation, and encouraging students' active involvement in the learning process. Therefore, based on the

results of the pretest, posttest, student response questionnaires, and teacher response questionnaires, the developed learning media was declared highly effective, feasible, and practical for use in learning activities.

4. CONCLUSION

Based on the results of the research and development of the augmented content-based interactive pocket book learning media product in science subjects at Islamic Elementary School Podorejo Sumbergempol Tulungagung, as well as the research problem formulation and the analysis results of this study, it can be concluded that the development of the augmented content-based interactive pocket book learning media was

carried out using the ADDIE model, which consists of the stages of analysis, design, development, implementation, and evaluation. The development process began with the analysis of learning objectives and learning needs, followed by product design, media development, media validation and revision, pretest and posttest trials, distribution of response questionnaires, and finally evaluation. The validation results obtained from the material experts and media experts reached 95.38% from the material experts and 92.30% from the media experts. These percentages fall into the Highly Feasible category, indicating that the augmented content-based interactive pocket book learning media was suitable for use in the learning process and capable of supporting the development of students' visual literacy.

The effectiveness of the augmented content-based interactive pocket book learning media was demonstrated through the results of the pretest and posttest trials, as well as the student and teacher response questionnaires. The trial results showed an improvement in students' average scores from 38.18 in the pretest to 86.59 in the posttest. The N-Gain analysis produced a score of 0.78, which falls into the High category. In addition, the student response questionnaire obtained a percentage of 92.35% categorized as Very Good, while the teacher response questionnaire obtained a percentage of 92% categorized as Highly Feasible. Therefore, it can be concluded that the augmented content-based interactive pocket book learning media was proven effective in improving students' understanding and capable of supporting the development of students' visual literacy in science learning.

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