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Development of Augmented Reality Book Learning Media Based on Assemblr Edu on Body Organs Material in Elementary Schools

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Abstract

Purpose: This research aims to develop an Augmented Reality Book based on Assemblr Edu as teaching material to support science learning, Body Organs material for class V students, which is still not available because the material contains abstract concepts and makes it difficult for students to understand science learning. **Methods**: The type of research used is Research and Development (R&D) with the ADDIE (Analyze, Design, Development, Implementation, Evaluation) development model. This research was carried out in class V of SDN Curahgrinting 3 Probolinggo. 4 class V students were tested on a small scale and 14 class V students of SDN Curahgrinting 3 Probolinggo were tested on a large scale. The instruments used in the research were validation questionnaires from material science experts and media experts as well as pretest and posttest. **Results**: The results of the research and development that have been carried out obtained (1) the percentage of validation scores for science material experts of 89% with revisions according to suggestions and (2) the percentage of validation scores for media experts of 93% with revisions according to suggestions. These results show that the level of validity of the book developed is declared very valid. The teacher response score percentage results were 94% and the student response test results were: (1) Small scale tests were 89% with very good criteria, and (2) Large scale tests were 93% with very good criteria. criteria, thus the Augmented Reality Book is very good. good for use in learning. The pretest and posttest results show that the Augmented Reality Book learning media based on Assemblr Edu is effective, this is proven by the fact that all class V students can be said to have completed with a percentage of 100% after studying with the Augmented Reality Book media and obtaining the Minimum Completeness Criteria (KKM) score. **Conclusion**: Augmented Reality Book learning media based on Assemblr Edu Body Organs is stated to be very suitable for use in the classroom learning process and can increase motivation and stimulate student learning activities. The implication is that the use of this learning media can increase student motivation, deepen understanding of concepts, and facilitate the development of technological and collaborative skills.

Keywords: *augmented reality book, assembler edu, body organ material.*

INTRODUCTION

Learning is carried out through interaction between teachers and students through various methods to achieve learning objectives. There are three types of learning objectives, namely, providing knowledge, instilling perspective, and training students' skills (Muhammad et al., 2021; Li et al., 2020). It is hoped that these three learning objectives will help students solve the problems they encounter in everyday life. Teachers must provide various techniques, models, media and methods to help students achieve these goals. Besides that, (Yousef, 2021; Campos-Pajuelo et al., 2022) revealed that learning presented in different ways by teachers can help students achieve learning goals and reduce their boredom.

Learning is not the same as learning. Learning is a learning process carried out by teachers to grow their ability to construct new knowledge. Learning is also considered an effort to improve mastery of subject matter. This is clearly different from learning, which can be defined as an effort to develop students' creative thinking abilities. It can be concluded that learning is a process of student interaction with educators and learning resources in the learning environment and helps students learn well. Meanwhile, another definition states that learning is the support provided by the teacher for the process of receiving knowledge, controlling skills and habits, as well as forming views and self-confidence (Casteleiro-Pitrez, 2021; Weng et al., 2020; Zafeiropoulou et al., 2021).

Science (Natural Science) learning has been taught since class III in elementary school. Science in elementary school contains knowledge about nature and living things. Science also helps people understand the problems of everyday life and understand how to keep the surrounding environment sustainable make a description regarding the novelty of this research, as well as a statement of interest in carrying out this development and research.. Science is a field of study of natural phenomena. Natural science is a subject in elementary school with the aim of students gaining structured knowledge, ideas and concepts about the natural environment through their own experiences through various scientific processes, such as research, creating and conveying ideas.

In the new academic year 2022/2023, the Independent Curriculum is regulated by the Ministry of Education, Culture, Research and Technology (Kemendikbud Ristek). According to Fransiska et al., (2023) the Independent Curriculum is a curriculum that has a variety of intracurricular learning to help students learn better and strengthen their abilities and teachers have the freedom to choose teaching materials that are tailored to the learning needs and interests of each student. In the Merdeka Curriculum there is a change, namely combining science and social studies subjects into Natural and Social Sciences (IPAS) in elementary schools. The reason why science and social studies subjects are used as science subjects at primary school level in the independent curriculum is that children in elementary school can see the world as a whole and integrated, encourage holistic thinking, both natural and social and can increase the profile of Pancasila students.

Study conducted by Efendi & Suastra, (2023) conveyed that students are expected to have appropriate skills, interests, and good physical and psychological development during the learning mechanism. The entire process should be interactive, inspirational, fun and challenging, and provide enough space for creativity, initiative and independence. This shows that teachers, as part of the learning process in the classroom, must be able to create effective learning strategies to meet educational goals. In reality, many teachers in the field currently still

use guidebooks or Student Worksheets (LKPD) to plan their learning process. Based on the learning approach about human organs, the curriculum in grade V elementary schools is currently still dominated by conventional learning approaches which are not supported by appropriate learning media. Elementary schools only use textbooks that have a limited number of pages, so the amount of information explained in the books is reduced (Syaharani & Fathoni, 2023). Apart from that, there are several other obstacles in delivering this learning, one of which is the shape of the human body's organs which are only depicted in two dimensions, including the digestive, respiratory and circulatory systems. In addition, explanations of how each system works are only given in writing, so students will only understand the theory as a whole. Limitations in learning resources such as books or handouts can reduce students' interest in learning.

Based on the results of initial research conducted at SDN Curahgrinting 3 Probolinggo, books were used as a learning resource and as learning media in the form of PowerPoint in learning. Science subjects about body organs are often considered difficult by teachers in their learning media. Creating science learning activities about biology that create abstract concepts is a problem often faced by teachers. For example, science learning about the organ systems of living things, anabolism, metabolism, the regulation system, the nervous system, the reproductive system, and the human digestive system which includes the digestive system and the food digestion process. So, this material contains abstract concepts and makes it difficult for students to understand science learning material.

As technology advances it can influence many aspects of life, including education. With various approaches, learning media have been created in response to technological advances. Students not only learn conventionally but also use modern learning models or media so that learning is more effective and students can definitely participate more actively in learning because the use of media has the potential to increase their motivation and stimulate their learning activities (Sahin & Yilmaz, 2020).

Considering technological developments, especially the smartphone sector which is growing rapidly on the market, we must make good use of it so that it can have positive value (Danaei et al., 2020). The world of technology is greatly influenced by current developments, and cannot be separated from advances in information and communication technology which covers almost all aspects of daily life. This sophistication is widely used to improve and streamline all activities in daily life (Demitriadou et al., 2020). This usefulness is also felt in education, especially the use of technology to deliver teaching materials (Karacan & Akoglu, 2021). Teaching materials that use technology can make the learning atmosphere fun and interesting for students (Alalwan et al., 2020). The development of this technology can be in the form of an application that can be installed on an Android smartphone device which contains content related to the introduction of computer hardware which is presented in 3-dimensional format as a result of the development of Augmented Reality (AR) technology (Pathania et al., 2023). Information related to the introduction of human body organs using Augmented Reality technology was also presented in previous research to be more interactive and innovative, where the introduction of the structure and function of the human body based on Augmented Reality can help laboratory instructors in assisting and teaching practice (Saif et al., 2021).

Based on the previous description, it shows that Augmented Reality technology can be used to create interactive learning resources to make education more innovative, creative and interesting. The novel contribution of this research is in the development of media based on the

Augmented Reality Book Application which will display real body organs, with objects in the form of three-dimensional animation accompanied by explanations.

RESEARCH METHODS

In this research, the Research and Development (R&D) research and development method was used (Safitri et al., 2020). The development approach used in this research is the ADDIE (Analyze, Design, Development, Implementation, Evaluate) model developed by Dick & Carey and the results of the Augmented Reality Book teaching materials based on Body Organ Material Assemblr Edu to make education more innovative, creative and interesting. The Addie approach model can be seen in Figure 1, as follows:

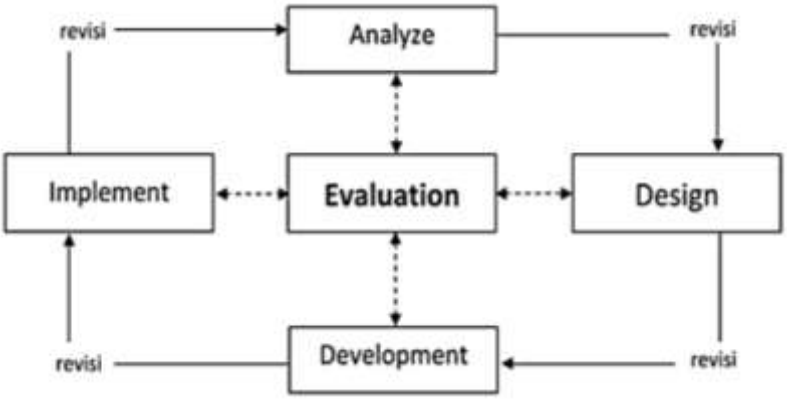

Figure 1. Addie Model Approach Diagram

This research and development procedure will consist of steps, namely first, analysis. At this stage, an analysis of the needs for making teaching materials will be carried out. Performance analysis is performed to determine whether performance problems exist or not. Needs analysis is also very important to find out students' needs regarding learning problems. Apart from that, analysis of Learning Outcomes and Flow of Learning Objectives is also carried out to prepare the material that will be included in the product. These products will be made based on the independent curriculum and in accordance with the current school curriculum. Second, at the design stage, learning materials are prepared, media is selected, and an initial design is created, which includes designing media formats and preparing instruments. The planning stage for developing teaching materials to be made is known as the design stage. One of the goals of this design is to simplify the process of making products that match the needs analysis. From the Augmented Reality Book above, it can be developed into a storyboard which is an initial design in developing Augmented Reality Book media. Third, at the development stage, the aim is to assess the researcher's ability to create Augmented Reality book-based teaching materials that are tailored to learning outcomes. The aim of this stage is to complete the product design for an Augmented Reality-based book assisted by Assemblr. Furthermore, the teaching materials for the Augmented Reality-based book were validated by experts. The purpose of this validation is to ensure that the teaching material is valid. On the other hand, material experts assess the appropriateness of the content, presentation and language aspects. Media experts assess the graphic's appropriateness. Fourth, namely Implementation. At this stage, books based on Augmented Reality will be tested on class V students at SDN Curahgrinting 3 Probolinggo and will receive feedback from teacher and student assessments through response questionnaires. To find out how well books based on Augmented Reality can be understood, 4 students were tested in small groups or on a small scale. After small-scale

trials, the results were used to revise the product, so as to enable large-scale trials on 14 class V students at SDN Curahgrinting 3 Probolinggo. In this way, the teaching materials that have been developed can be known to be interesting for students. Fifth, namely the evaluation stage is arranged at each stage above, and the researcher measures the quality of the product that has been developed based on the results of the questionnaire that has been distributed and assessed by the teacher and student responses.

The subjects in this research were 14 class V students at SDN Curahgrinting 3 Probolinggo and 1 homeroom teacher for class V at SDN Curahgrinting 3 Probolinggo. The validators consisted of 2 FKIP Lecturers from Panca Marga University, Probolinggo. The object of this research is the Augmented Reality Media Book based on Assemblr Edu on Body Organs for class V SDN/MI. This research was carried out at SDN Curahgrinting 3 Probolinggo, and was carried out in January 2024 starting from January 5 – January 11 2024.

Instruments for this research stage include a needs analysis questionnaire instrument, a material expert validation instrument, a media expert validation instrument, and a teacher response assessment questionnaire. In addition, an instrument to test student responses was also designed. Mark each column on the instrument sheet with a checklist. Additionally, it can provide feedback, which can be included in suggestions and comments sheets.

This research uses data analysis methods, namely expert validation (consisting of material experts and media experts) as well as teacher response analysis and student response analysis. To determine the level of validity and practicality of this Augmented Reality-based book, a quantitative data analysis method is needed and using a pretest carried out before giving the Augmented Reality Book learning media and a posttest carried out after giving the Augmented Reality Book learning media to determine the effectiveness of the learning media.

RESULTS AND DISCUSSION

Analysis, design, development, implementation and evaluation are the stages of the ADDIE model developed by Robert Maribe Branch.With ADDIE, students are positioned as the center of learning that makes them creative and inspires them (Widyastuti, 2019).The results of this research and development produced a product in the form of Augmented Reality Book Learning Media Based on Assemblr Edu Body Organ Material for Class V Students at SDN Curahgrinting 3 Probolinggo. The following are the results of the research:

Analysis

In the initial stage, research was carried out with performance analysis, needs analysis and learning achievement analysis. The data generated at this stage is as follows:

1. Performance Analysis

   Performance analysis involved interviews with class V teachers and class V students at SDN Curahgrinting 3 Probolinggo. Interviews with science teachers show that both teachers and students face many problems in learning science, especially body organ material. By applying our knowledge and understanding to everyday activities, material demands can solve complex problems. Our understanding of Body Organs material becomes less effective when we apply our knowledge and understanding to daily activities. Learning resources are textbooks and PowerPoint. However, students were not actively involved, so the material was not conveyed completely.

The results showed that learning science, especially body organ material, was very difficult, and interviews were conducted with 7 class V students at SDN Curahgrinting 3 Probolinggo, and it was found that learning science felt difficult. They found that abstract material such as Body Organs required more media or supporting teaching materials to make it easier for students to understand it. These results are in line with research Syarifuddin (2020) which states that elementary schools currently use conventional learning approaches that are not supported by appropriate learning media. Elementary schools only use textbooks, which have a limited number of pages, so the amount of information explained in the books is reduced. Apart from that, there are several other obstacles in the delivery of this lesson. For example, images of the human body's organs are only given in two dimensions, including the respiratory, digestive, and circulatory systems, and explanations of how each system works are only written. As a result, students will only understand the theory.

2. Needs Analysis

The needs analysis questionnaire was distributed to 14 class V students of SDN Curahgrinting 3 Probolinggo. The results are shown in the following table 1:

Table 1. Data from Analysis of Student Needs

No	Question	Answer	Amount	Percentage
1.	The need for learning supporting media	Yes	13	92%
		No	1	7%
2.	Learning media such as books accompanied by 3D/Augmented Reality content	Yes	12	85%
		No	2	14%
3.	Learning media such as images or videos	Yes	13	92%
		No	1	7%
4.	Media related to technology	Yes	12	85%
		No	2	14%
5.	The need for learning support media in the form of books based on Augmented Reality Books assisted by Assemblr Edu	Yes	13	92%
		No	1	7%
Total			**14**	**100%**

The results of the needs analysis, which can be seen from table 1. Analysis of student needs was carried out by distributing needs analysis questionnaires to 14 students from class V of SDN Curahgrinting 3 Probolingo. The results show that 92% of students need additional media to learn science material about Body Organs. By considering the media that already exists in schools, the media that is expected to be developed can involve participants in the class. As many as 85% of students expect learning media or teaching materials such as the Augmented Reality Book which provides additional teaching materials that can be used independently with clear descriptions of the material and attractive designs. 3D content allows students to gain their own understanding of what they are learning. 92% of students expect learning media such as Figures or videos. 85% of students expect technology-based learning media, related to Augmented Reality Books, which allows students to enjoy content via cellphone and makes learning easier. In addition, 92% of students agree that learning support media is a mustin the form of an Augmented Reality Book based on Assemblr Edu. The description of students when filling out the needs analysis questionnaire can be seen in Figure 2, as follows:

Figure 2. Students fill out the needs analysis questionnaire

Based on the information collected, it can be concluded that students are more interested in teaching materials or learning support media that are new and related to technology. With this Augmented Reality Book learning media, students can learn independently in a fun and easy way. This book also allows students to evaluate their ability to understand the material independently. This is comparable to research Kounlaxay et al., (2021) where the results show that the Augmented Reality Book learning media was created specifically for use on mobile phones and focuses more on students' independent learning. With its advantages, this learning media can increase students' enthusiasm for learning.

3. Analysis of Learning Outcomes

Analysis of learning achievements and learning objectives is the final analysis activity. This is done with the aim of studying the main concepts taught to determine the components that will be obtained in media development. The learning objectives for Body Organs material and learning achievements are based on the Independent Curriculum which is in accordance with the applicable school curriculum.

The science and science learning achievement is that students carry out simulations using simple Figures/charts/tools/media about the human body's organ systems (respiratory/digestive/circulatory systems) which are related to how to properly maintain the health of their body organs.

The objectives of learning Body Organs using the Augmented Reality Book learning media are as follows:

1) Students are able to identify human body organ systems (respiratory/digestive systems) by reading Augmented Reality-based books correctly.
2) Students are able to show parts of the human body organs (respiratory/digestive system) by reading Augmented Reality-based books correctly.

Design (Planning)

The next data is found at the design stage, where the tasks carried out are compiling learning materials, selecting media, and creating an initial design. At the stage of compiling learning material using Body Organs material which discusses the Human Respiratory Organs which consist of the nasal cavity, pharynx, throat and throat branches, lungs, and diaphragm, and also the Human Digestive Organs which consist of the oral cavity, esophagus, stomach, small intestine, rectum and anus. This Body Organ material is used in developing the Augmented Reality Book learning media. The details are as follows:

1. Preparing Learning Materials

   Learning materials are prepared by conducting an investigation into Learning Achievements and Learning Objectives. With learning material on Body Organs, the subject matter of the respiratory system includes the Nose, Pharynx, Throat and Throat Branches, Lungs, and Diaphragm, as well as the human digestive system which includes the Mouth, Throat, Stomach, Small Intestine, Rectum, and Anus.

2. Media Selection

   The choice of teaching material media has been adjusted to student needs. The teaching material developed is in the form of Augmented Reality Book learning media based on Assemblr Edu on Body Organs. This AR-based book has been adapted to students' needs and can help students learn independently. This book was created using the Adobe Illustrator application. Adobe Illustrator is a program owned by Adobe that is used to create works of art, images, illustrations and social media content using a computer. This platform was used to design the entire book. Meanwhile, the Assemblr Edu application is used to create Augmented Reality content. This Assemblr Edu platform allows users to create two-dimensional and three-dimensional content visualized in Augmented Reality in an easy way. The design of all parts of this book was created purely by researchers and without assistance from other parties. This book is made in standard A4 size (29.7 x 21 cm), using Art Carton paper for the cover and AP 100 for the book contents.

3. Preliminary Design

   Product preparation is carried out during initial design before being tested on students, so first prepare the design of teaching materials and instruments, including the following:

   a. Media Format Design

      This media format design was prepared using the initial format for Assemblr Edu-based Augmented Reality book design. Creating an initial design begins with making a book cover, the contents of the book consisting of a table of contents, introduction, learning activities that provide an explanation of the subject of Human Body Organs, formative tests, glossary, answer key, and a bibliography. The format for the Augmented Reality book based on Assemblr Edu can be seen as follows:

      1) Create the initial appearance of the Augmented Reality Book learning media by adding several components such as appropriate writing, images, logos.
      2) Create a table of contents display to make it easier for users to find the desired discussion and provide users with an overview or outline of the subject matter contained in the AR-Book.
      3) The introductory section contains a brief description or summary regarding learning about body organs as well as finding the main parts of the content in the AR-Book.
      4) Create learning objectives that have been adapted to the Teaching Module and design instructions for using the media to make it easier for users to use the Augmented Reality Book media.
      5) Includes images of the shape of human body organs and also adds a 3-dimensional animation of human body organs by scanning Augmented Reality barcodes using the Assemblr Edu application which will later appear an animation of human body organs, and there is a learning song about body organs in the respiratory and

digestive systems as well There is an Assemblr Edu barcode which will later appear in the form of a video about the body organ learning song so that learning is more interesting with the song.

6) Look for various references to body organ learning material related to the material that will be used in the Augmented Reality Book learning media as well as displaying barcode scans using the Assemblr Edu application.
7) Give practice questions after students have studied the previous material, provide instructions for evaluating the results of formative tests, as well as answer keys.
8) Including a glossary aims to enable users to find out explanations of words or terms that are still not understood by users and by creating a glossary it is best to use specific and concise explanations, so that they are easy for users to understand.
9) Next, include a bibliography or reference sources that the researcher included in the book and provide further information to AR-Book users.
10) The back cover displays words about the physical perfection of humans which Allah created in the best form. The design media that has been created can be seen in Figure 3.

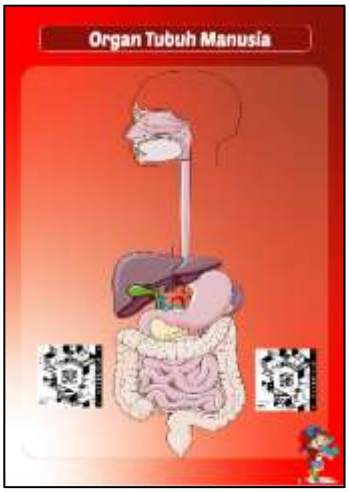

Figure 3. Media Design

b. Instrument Preparation

After initial design, this was done by compiling an instrument consisting of a material expert validation instrument, a media expert validation instrument, and a student response instrument. The material validation instrument consists of three aspects: content, presentation, and language. The media validation instrument consists of graphic feasibility aspects. The student response instrument consists of two aspects: operation or use of the media, and user reactions.

Development

Several actions were taken during this development phase, including the following:

1. Material Expert Validation

The aim of assessing Augmented Reality Book learning media for material experts is to determine the validity of the material based on Body Organs material, including appropriateness of content, appropriateness of presentation, and language aspects. Mrs. Ani Anjarwati, S.Pd., M.Pd. is a FKIP lecturer who teaches science learning courses at Panca Marga University for assessment as a material expert on January 4 2024. The results of the

material expert assessment are presented in the following table 2:

Table 2 Material Expert Validation Result Data

No.	Aspect	Validation Score	Percentage	Criteria
1.	Content Feasibility Aspect	26	86%	Very Valid
2.	Aspects of Feasibility of Presentation	10	100%	Very Valid
3.	Language Aspects	13	86%	Very Valid
Amount		**49**	**89%**	**Very Valid**

The material expert's results of 86% met the very valid criteria for appropriateness of content, with suitability of the material, accuracy of the material, and encouraging students to search for more. On the other hand, the material expert's results of 100% meet the very valid criteria for the feasibility of presenting an Augmented Reality Book, where the concept coherence technique is used in accordance with the learning objectives and the material is presented in an appropriate way. Apart from that, the average score for material experts of 86% has very valid criteria for the appropriateness aspect of language, with the language used in the book being communicative and the sentences explaining the material being easy to understand. Thus, the average score for material experts is 89% with very valid criteria and the Augmented Reality Book media that has been developed can be used in learning. According to Mrs. Ani Anjarwati, S.Pd., M.Pd., as a material expert, the Augmented Reality Book is very suitable for development.

2. Media Expert Validation

The Augmented Reality Book learning media assessment of media experts aims to determine the suitability of the graphics. Mrs. Shofia Hattarina S.Pd., M.Pd., FKIP lecturer who teaches Resources and Learning Media at Panca Marga University, for assessment as a media expert on December 21 2023. The results of the media expert assessment are shown in the following table 3:

Table 3 Media Validation Result Data

No.	Aspect	Validation Score	Percentage	Criteria
1.	Graphic Feasibility Aspects	70	93.3%	Very Valid
Amount		**70**	**93.3%**	**Very Valid**

The results of the assessment carried out by media experts showed that the Augmented Reality Book which was designed based on graphic aspects had a percentage score of 93.3%, and this criterion was very valid. This shows that the teaching materials are made according to the size of the book and meet the material contained therein. The book cover design displays harmonious layout elements, the letters used are attractive and easy to read, and the character of the object is displayed in the book cover image. In the design of the book's contents, the layout and layout elements are harmonious and complete, and the typography is simple and easy to understand. According to Mrs. Shofia Hattarina, S.Pd., M.Pd., as a media expert, the Augmented Reality Book is very suitable for development.

Implementation (Application)

This stage is after the development stage. At this point, the teaching material development design that has been created is then validated by material experts, media experts, and then tested on students. The trials carried out are as follows:

1. Small Scale Product Trials

The first product trial, namely a small scale test, aims to evaluate the teaching materials that will be developed using the Augmented Reality Book learning media. On Wednesday, January 10 2024, 4 students from class V of SDN Curahgrinting 3 Probolinggo assessed two aspects, namely the operation or use of media and the user reaction aspect. The results of small-scale trials are shown in the following table 4:

Table 4 Small Scale Trial Results Data

No.	Aspect	Score	Percentage	Criteria
1.	Aspects of Operation or Use of Media	53	88.3%	Very good
2.	User Reaction Aspects	124	88.5%	Very good
Amount		**177**	**88.5%**	**Very good**

In a small-scale test carried out on four class V students at SDN Curahgrinting 3 Probolinggo, an average score of 88.5% was obtained with very interesting criteria. Details of the small-scale test including operational aspects or media use were 88.3%, which shows that the Augmented Reality Book can be used easily and the content makes learning Body Organ Science more interesting. Apart from that, the user reaction aspect received a score of 88.5%, with very interesting criteria, such as material that is easy to understand, makes it easier for students to learn independently, and an attractive appearance that can increase students' interest in learning.

2. Large Scale Product Trials

The aim of the next product trial is to evaluate the practicality of the Augmented Reality Book learning media that has been developed. A large-scale product trial was carried out on Thursday, January 11 2024, on 14 students from class V of SDN Curahgrinting 3 Probolinggo. The results of large-scale trials are shown in the following table:

Table 5 Large-Scale Trial Results Data

No.	Aspect	Score	Percentage	Criteria
1.	Aspects of Operation or Use of Media	190	90.4%	Very good
2.	User Reaction Aspects	462	94.2%	Very good
Average Score		**652**	**93%**	**Very good**

Table 5 showswith a percentage of 93% with very interesting criteria, this Augmented Reality Book has an attractive appearance that makes students more interested in learning. Apart from that, Augmented Reality content makes learning Body Organ Science more interesting. These results are in line with researchNingrum et al., (2022:1297)where this research develops Augmented Reality-based media which is very effective for use in learning and has the ability to increase students' interest in learning science. In addition, the breakdown of large-scale tests in the aspect of operation or media use was 90.4%, which shows that the Augmented Reality Book can be used easily and its content makes learning Body Organ Science more interesting. Apart from that, the user reaction aspect received a score of 94.2%, with very interesting criteria, such as material that is easy to understand, makes it easier for students to learn independently, and an attractive appearance that can increase students' interest in learning. The media implementation can be seen in figure 4 as follows:

Figure 4. Implementation on Media

Evaluation

In this research, each stage of ADDIE can be used to carry out evaluations. The purpose of this evaluation is to examine data obtained from research results, including analysis of student needs, design preparation, product validity by experts, teacher response assessment questionnaires and student response questionnaire results, and product effectiveness when used in learning. The final results of the evaluation stage show that the product developed on the Augmented Reality Book learning media based on Assemblr Edu on Body Organs material has very interesting criteria and is suitable for use during learning..

On January 11 2024, 14 class V students received evaluation questions after the learning process through learning media. To find out how effective the use of Augmented Reality Books is as a learning medium in increasing students' understanding of body organ material in science learning, it can be done by comparing the results of the pretest and posttest. According to the class V teacher's statement during the interview, the KKM (Minimum Completeness Criteria) value set by SDN Curahgrinting 3 Probolinggo, namely 70, indicates that the evaluation results are considered complete.

Table 6. Pretest and Posttest Results

No.	Aspect	Pretest	Posttest
1	**The number of students**	14	14
2	**Total value**	760	1160
3	**Average Value**	54	83
4	**The highest score**	80	100
5	**Lowest Value**	30	70
6	**Average Increase**	**29**	

Table 6 above shows that there was an increase in the average value of the evaluation results on the pretest and posttest. The average score on the pretest was 54, while the posttest score reached 83, resulting in an average increase of 29. From this explanation it can be concluded that the use of Augmented Reality Book media is declared feasible and effective in improving students' learning comprehension abilities in learning Body Organ Science. The results of the media evaluation documentation can be seen in Figure 5 as follows:

Figure 5. Evaluation of the Media

CONCLUSION

Based on the results of the research conducted, it can be concluded that the development of Augmented Reality Book Learning Media based on Assemblr Edu on Body Organs material for class V students at SDN Curahgrinting 3 Probolinggo has been declared very suitable for use in the learning process in the classroom. With this book, students can learn independently through fun and easy experiences, thus contributing to scientific development in the field of technology education and technology-based learning. The suggestion given is to continue research and further development in integrating Augmented Reality technology in the learning curriculum to increase learning effectiveness. The implication of the results of this research is that the use of Augmented Reality Book learning media can increase student involvement and independence in learning, as well as enrich their learning experience through an innovative and interesting approach.

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