JPPIPA 11(2) (2025)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Development of E-Books Assisted by Augmented Reality on Respiratory System Material for Grade V Elementary School

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Received: September 30, 2024
Revised: January 10, 2025
Accepted: February 25, 2025
Published: February 28, 2025

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DOI: 10.29303/jppipa.v11i2.10320

Abstract: Learning (IPAS) in elementary schools has many obstacles and shortcomings. This study is an R&D study referring to the Borg and Gall model with the aim of testing the feasibility, practicality, and effectiveness of e-book media assisted by augmented reality (AR). Data collection was carried out using test techniques (pretest and posttest) and non-tests in the form of observations, interviews, surveys, and document data. Feasibility is shown from the results of the validation test by expert validators in language, materials, and media showing that the AR-assisted e-book media has met the criteria that are very feasible. Based on the results of the pretest and posttest, it shows that the AR-assisted e-book media is effective in improving student understanding with an increase in the average pretest and posttest scores shown from the T-test results showing a value of 0.001, and the N-gain test results obtained 0.85. Practicality is shown from the results of the teacher and student response questionnaire which received very positive responses from teachers and students. The data shows that AR-assisted e-book media is practical, feasible, and effective in improving understanding of the human respiratory system material in class V of SD Negeri Karangjati 04.

Keywords: Augmented reality; E-Book; Respiratory system

Introduction

According to Permendikbudristek Number 47 of 2023, Article 15 paragraph (2) states that in creating an Education Unit climate as referred to in paragraph (1) letter a, it is necessary to encourage: a. improving the quality of learning; b. realizing inclusivity; c. realizing tolerance towards diversity; d. realizing a safe and comfortable learning environment; and e. growing a learning culture for students. So, in implementing educational activities, it can create a quality education unit climate so that students will also be comfortable in learning which will foster a learning culture for children. Education is an effort that is carried out consciously so that students can play an active role, develop their potential, and improve the quality of knowledge by utilizing learning resources at school (Retno-Palupi et al., 2022). However, in reality, improving the quality of learning has not been realized optimally. This is in accordance with research (Jannah & Atmojo, 2022), which shows that students' critical thinking skills are not optimal because the use of learning media in elementary school science learning is not in accordance with the characteristics of students or teaching materials. The dominant role of teachers in learning (teacher-centered learning), not using innovative learning media, and still being fixated on one learning source also results in less than optimal learning outcomes (Mulyosari & Khosiyono, 2023). The lack of availability of teaching materials and the inappropriateness of the content/content of teaching materials to the subject matter also inhibit the process of understanding concepts. In learning, there is no use of technology-based learning media because learning is still carried out conventionally.

How to Cite:
Andini, S. H., & Setyasto, N. (2025). Development of E-Books Assisted by Augmented Reality on Respiratory System Material for Grade V Elementary School. *Jurnal Penelitian Pendidikan IPA*, *11*(2), 663–674. https://doi.org/10.29303/jppipa.v11i2.10320

From several problems presented above, the same problem also emerged in class V at SD Negeri Karangjati 04, researchers found various problems including the difficulty of teachers in increasing student activity in learning. This is caused by various obstacles, including students who have difficulty understanding science learning because there are too many theories. The learning resources used are also still dominated by printed books/textbooks and LKS books from the government. This results in students having an imperfect understanding of the material being studied. Based on the results of interviews with grade V teachers, the obstacles experienced by teachers in the learning process are in the activeness of students. In learning activities, only a few students are active (Thiele & Kordts, 2024; Arthurs & Kreager, 2017). Teachers have difficulty in arousing students' learning motivation. The use of learning resources has been varied, namely by using printed teaching materials, LKS, and using YouTube videos. However, the application of these learning resources has not been very effective. Students prefer learning activities using fun learning media, for example by using technology. However, the learning media used is also not very effective, for example in the respiratory system material. Teachers have not been able to present concrete learning media or images of the shape of the human respiratory system diagram. Teachers have also not maximized the use of technology in learning so that students do not like the respiratory system subject (Puspaningsih, 2021; Dewi & Setyasto, 2024).

In the use of technology, schools have also not done it effectively and optimally. This can be seen from the results of the interview that the school already has WIFI with a good signal but has not been integrated optimally in learning. In the use of IT-assisted learning resources, it can actually be done more variedly and maximized for each subject matter. Based on the results of the questionnaire that has been completed by students, 16 out of 19 students (84%) already have a cellphone that can be used to access the internet. Of the 19 students, 15 students can operate a cellphone well, while the other 4 students rarely operate a cellphone. There are only 5 students who use cellphones to search for additional materials, there are 9 students who spend a lot of time playing games, 3 students who use cellphones to play social media, and 2 students use cellphones to watch YouTube. This means that 14 out of 19 students (74%) have not utilized their cellphones properly, only using cellphones to play games, play social media, and watch YouTube. In fact, based on the questionnaire data, many students like to use mobile phones to support learning materials. Based on the results of the completed parent questionnaire, 14 out of 19 parents of students (74%) agreed that parents allow their children to bring mobile phones to school with teacher supervision. There were 5 out of 19 parents of students (26%) who did not agree if their children brought mobile phones to school for learning even with teacher supervision. So it can be concluded that around 74% of parents of students agree and allow their children to bring mobile phones to school for learning activities with teacher supervision. From the interview results, quite a lot of problems were found in science learning, from the lack of student activity in learning activities, the ineffective use of learning resources, the lack of IT utilization in learning activities, and there are still many students who have mobile phones but only for playing games and social media. From the data on the learning outcomes of class V students of SD Negeri Karangjati 04, it can be seen that the results of learning science are not yet satisfactory. Of the 19 students, 4 male students and 4 female students, there were 8 students (42%) who had not fulfilled the KKTP and 11 students (58%) had fulfilled the KKTP, with the KKTP used being 85.

The development of creative and innovative learning media will make students interested in learning activities, so that the development of technology-based media can be a solution to overcome several problems in this study (Daryanes et al., 2023; Kerimbayev et al., 2023). E-Books are digital books that can be viewed on a screen containing images, text, or both (Maula et al., 2024; Furenes et al., 2021). E-Books can be opened via smartphones, laptops, or other devices (Wang et al., 2023). The use of E-Books can have a positive impact on both teachers and students. The positive impact on teachers is that it can make it easier for teachers to deliver material in a more varied form and easy for students to understand (Francisca et al., 2022; Hanikah et al., 2022). By using e-books, it will be more effective for students in interpreting and understanding information through interactive features that will make students happy to read and encourage students to engage in conversations that improve reading comprehension with their peers (Karakoç-Öztürk, 2021; Rajab et al., 2024; Syakur et al., 2023). One of the media that can be used in science subjects is e-books. Based on the results of previous studies, it shows that e-books are proven to be valid and can be used effectively in improving students' conceptual understanding and learning outcomes (Ciptaningtyas et al., 2022; Efendi et al., 2022; Zhao et al., 2021). The novelty developed by researchers compared to previous studies is the use of non-printed learning media assisted by augmented reality. This e-book is intended for grade V of elementary school with respiratory system material. The developed e-book allows students to scan a QR code marker connected to an augmented reality-based

visualization. This study aims to develop an augmented reality-assisted e-book, which is designed to be accessible anytime and anywhere with digital devices such as mobile phones. This makes it easier for students to learn independently and flexibly. With an augmented reality-assisted e-book, students can scan the QR code related to the 3D image in the e-book to obtain an augmented reality visualization. For example, the shape of the respiratory system organs which are usually only 2D images in student books, in this e-book are visualized with augmented reality in a more concrete 3D form with the addition of animations of the organs involved in the respiratory system accompanied by a complete explanation of the function of each organ of the respiratory system. E-book learning media will make learning more interesting, interactive, and can provide a new learning experience.

Based on these problems, it was identified that in learning activities, there is still a lack of use of IT-assisted teaching materials and the lack of visualization of science and natural science materials to be more real and clear, so that researchers developed an e-book assisted by augmented reality in the Science Subject of Respiratory System Material for Class V of SD Negeri Karangjati 04. The purpose of this study was to test the feasibility, practicality, and effectiveness of the developed product. So, it is hoped that this learning media can make it easier for students to understand the respiratory system material in class V of elementary school.

Method

This type of research is research and development (R&D) by developing an AR-assisted e-book product on the respiratory system subject for grade V of elementary school. The focus of this research is on the development of an augmented reality-assisted e-book on the science subject of the human respiratory system in grade V of elementary school. In developing this media, the researcher carried out the development according to the procedure developed by Snyder (2019). This research refers to the Barg and Gall model which consists of 10 steps, but in this study the researcher only limited it to stage 8, namely the use of trials due to time and cost constraints. Therefore, the stages in this study consist of: potential and problems; data or information collection; product design; design validation; design changes; product testing; product changes; trial use. The research scheme can be seen in Figure 1.

The first stage is the potential and problems found in schools by conducting observations, interviews, documentation, and collecting data on students in grade V at SD Negeri Karangjati 04. The second stage is data collection used to design products that will be developed according to the needs of students at SD Negeri Karangjati 04 and then analysis of the data that has been collected. The third stage is to design a product that suits the needs of students that makes it easier for students to understand abstract objects from the human respiratory system material. The fourth stage is to validate the e-book design to the language validator, design validator, and material validator, by filling out a validation questionnaire sheet in the form of a Likert scale.

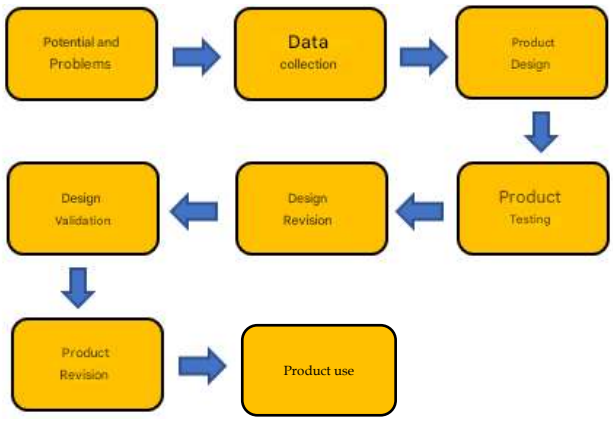

Figure 1. Modified from the Borg and Gall model

The fifth stage is to revise the design based on suggestions and input from the validator so that the product is ready to be tested. The sixth stage is to test the product on a small scale in class VIB consisting of 10 students using a deliberate sampling technique based on different levels of cognitive ability. At the product testing stage, learning activities are carried out using augmented reality-assisted e-books to determine the effectiveness of the products that have been developed. After the learning activities are completed, teachers and students fill out a response questionnaire sheet regarding the use of augmented reality-assisted e-book media. The seventh stage is to revise the product based on the results of the analysis of the teacher and student response questionnaire sheets. The eighth stage is the use of the product on a large scale which is carried out in class VB with 19 students to determine the effectiveness of the product developed.

Product effectiveness is determined by conducting a pretest and posttest analysis using the t-test, normality test, and N-gain test. The type of data used in this study is the main data obtained directly during the study consisting of qualitative and quantitative data. Qualitative data is obtained from observations, teacher interviews, analysis of value lists, and questionnaire sheets.

Quantitative data is obtained from pretest and posttest assessments. Data collection techniques use test

techniques and non-test techniques. The test technique is carried out by providing 30 multiple-choice questions. The questions presented are designed to measure students' understanding of the respiratory system material before and after the application of the developed learning media. All questions have gone through the content validity and empirical validity testing process, and were analyzed using the SPSS statistical application. The following is a summary of the results of the question item analysis:

Table 1. Summary of Question Item Analysis Results

Analysis Criteria	Analysis Results
Question Validity	All 30 questions are valid with correlation coefficient values > 0.51
Question Reliability	Cronbach's Alpha Coefficient 0.98
Difficulty Level	10 questions: Easy Category
Question Distinction Power	19 questions: Moderate Category
Conclusion	1 question: Difficult Category

Meanwhile, non-test techniques are carried out in the form of observations, interviews, and questionnaires. Determination of product feasibility is carried out by analyzing the assessment results of the three expert validators, namely expert validators of material, media, and language. The validation process is carried out by lecturers at Semarang State University as validators in accordance with their fields of competence. The aim is to obtain suggestions and assessments of important aspects of the product such as the suitability of the material, use of language, and presentation of media. The assessment results of the three validators are carried out using a Likert scale of 1-4.

The practicality of the product is determined from the results of the teacher and student response questionnaire related to the use of augmented reality-assisted e-book products in the learning process. This aims to identify the responses of teachers and students to the practicality of the product in supporting learning. The results of the product practicality assessment are carried out using a Likert scale of 1-4. The effectiveness of the product is carried out by analyzing the pretest and posttest data. The analysis process is carried out using a normality test, t-test, and N-gain test. The first step in the analysis process begins with a data normality test using SPSS software to ensure data normality. The second step of the analysis was continued with a t-test to test whether there was a significant difference between the pretest and posttest results. The third step of the analysis was continued by conducting an N-Gain test to measure the level of increase in pretest to posttest scores with the aim of evaluating the effectiveness of the product based on changes in student scores in large-scale tests.

Result and Discussion

Potential and Problems

Based on the results before the study, several problems were found, including the lack of student activity in learning activities, the ineffective use of learning resources, the inaccuracy in the use of mobile phones which are only used to play social media and games, and the lack of IT utilization for learning. Based on the results of the questionnaire that has been distributed, it is known that students are easily bored during learning and have reduced motivation to learn, the use of a variety of IT-assisted teaching materials that have not been implemented effectively. From the data on the learning outcomes of class V students of SD Negeri Karangjati 04, the results of learning science are not yet satisfactory. There are 42% of students who have not met the KKTP with the KKTP used, namely 85.

Initial Data Collection

Research data was collected from distributing questionnaires to teachers and students. Based on the results of the data collected, it is known that the respiratory system material in the teacher's book and student's book is still incomplete. So the use of learning resources is not effective, coupled with the lack of IT utilization in learning. In learning activities, only a few students are active. Teachers have difficulty in raising students' learning motivation. The use of learning resources has been varied, namely by using printed teaching materials, LKS, and using YouTube videos. However, the application of these learning resources has not been very effective. Students prefer learning that does not require too much brain power, such as learning while playing.

The learning media used is also not very effective, for example in the respiratory system material. Teachers have not been able to present concrete learning media or images of the human respiratory system diagram. For this reason, it is necessary to develop learning media that can attract students' attention by choosing designs, colors, and using images that can clarify students' understanding of the material. Another problem found is that many students still use cellphones only to play games and social media. As many as 84% of students already have cellphones that can be used to access the internet. However, as many as 76% of students have not used their cellphones properly for learning activities. This means that teachers need learning media that uses technology by utilizing the use of cellphones. Thus, the development of e-books assisted by augmented reality is

supported by artificial reality with materials that are tailored to the needs of students using language that is easy to understand so that students' understanding of the material can increase.

Product Design

Augmented reality-assisted e-books are designed according to the learning outcomes and learning objectives to be achieved in grade V on the human respiratory system material. This e-book will contain an explanation of the material in the form of writing, images, YouTube videos, and augmented reality about human respiratory organs that are made based on the characteristics of students so as to help students understand the material. This augmented reality-assisted e-book was created with the initial step of preparing the material, format, and layout to be used using the Canva application, while the objects for augmented reality were created using Assemblr Edu. The QR code created with the Assemblr Edu application is inserted on the e-book page in the Canva application.

The components in this augmented reality-assisted e-book include the front page (cover), foreword, study instructions, table of contents, concept map, general information, material description (there are 5 chapters), QR code of human respiratory system organs, reflection, quizizz, summary, glossary, bibliography, author identity, supervisor identity, cover page. Augmented reality-assisted e-books are used using the internet network. So, in learning, teachers must ensure a stable internet connection.

Figure 2. Title page

Figure 3. Study instructions page

Figure 4. Concept map page

Figure 5. Example of material page

Figure 6. Augmented reality QR-Code page

Figure 7. Author identity page

Product Feasibility

At this stage, the researcher validates the product with expert validators, namely language expert

validators, media expert validators, and material expert validators. After validation, there are several inputs about the product developed by the researcher so that the researcher can improve the product being developed. Learning media will enter the criteria that are very feasible if the score is 76%-100%, feasible if the score is 56%-75%, less feasible if the score is 36%-55%, and not feasible if the score is 20%-35%. Summary of validation results for each component in table 2:

Table 2. Results of Expert Validator Assessment of e-Books Assisted by Augmented Reality

Section	Media expert	Subject matter expert	Linguist
Total score	125	71	46
Maximum score	132	80	52
Percentage	94.70%	88.75%	88.50%
Criteria	Very worth it	Very worth it	Very worth it

Based on the results of the validator's assessment, it can be concluded in table 2, the augmented reality-assisted e-book has met the category of being very suitable for use in learning activities in terms of material, media, and language, but with several revisions.

Design Revision

After validation by experts, the researcher revised the media according to input from expert validators. There were several inputs including evaluation, adding introductory images to the media, adjusting images to the human respiratory process, and adding explanations to the bronchi and bronchioles.

Figure 8. Bronchus and bronchioles QR code page before revision

Figure 9. Bronchus and bronchioles QR code page after revision

Figure 10. Bronchus and bronchioles QR code page after revision

Figure 11. Chest breathing image page before revision

Figure 12. Chest breathing image page after revision

Figure 13. Abdominal breathing image page before revision

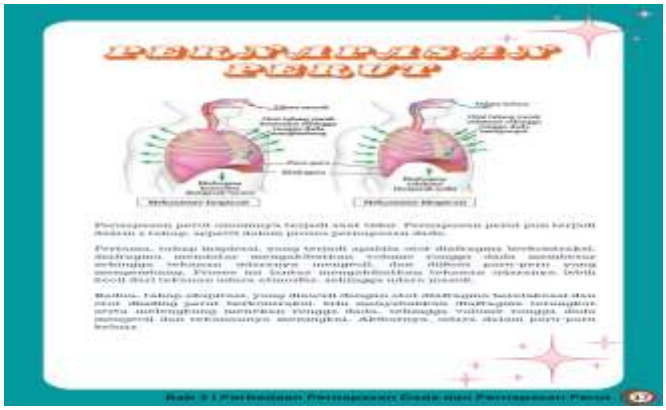

Figure 14. Chest breathing image page after revision

Product Practicality

The next step taken was to conduct a small-scale product trial using 10 students in class VI B who were selected heterogeneously based on the level of student ability with 4 students with high rankings, 3 students with medium rankings, and 3 students with low rankings. After the learning activities using augmented reality-assisted e-books were carried out, teachers and students were given a response questionnaire sheet containing 14 questions with four aspects including media, materials, learning, and language with a Likert scale that must be filled in based on their experience when using the product provided by the researcher. The response questionnaire has assessment criteria, namely very positive if the score is 76% - 100%, positive if the score is 51% - 75%, negative if the score is 26% - 50%, and very negative if the score is 0% - 25%.

Table 3. Results of Teacher and Student Response Assessment in Small-Scale Tests of Augmented Reality-assisted E-Books

Section	Teacher	Learners
Total score	93	510
Maximum score	96	560
Percentage	96.80%	91.10%
Criteria	Very Positive	Very Positive

Table 3 shows that the results of teacher and student responses to augmented reality-assisted e-book media provide very positive results and there is no input from teachers or students so that augmented reality-assisted e-book media can be used practically in learning activities. Because there are no suggestions and input from teachers and students, and the results of the media response questionnaire are included in the very positive criteria, there are no revisions to the product in the small-scale test.

Table 4. Results of Teacher and Student Response Assessment in Large-Scale Tests of Augmented Reality-assisted E-Books

Section	Teacher	Learners
Total score	94	1042
Maximum score	96	1064
Percentage	97.90%	98%
Criteria	Very Positive	Very Positive

Effectiveness of AR-Assisted e-books

A large-scale trial was conducted in class VB with a total of 19 students using augmented reality-assisted e-book media in the subject of science on the respiratory system material to determine the effectiveness of the product based on student learning outcomes. The research design used was an experimental preview design with a pretest and posttest preview design model.

Table 5. Pretest and Posttest Results on Product Use

Section	Average	Average Difference
Pretest	42.26	49
Posttest	91.26	

According to table 5, it is known that the average learning outcomes of students showed an increase of 49 points in large-scale product trials. This can be concluded that there is a difference in student learning outcomes in the subject of science on the respiratory system in class VB SD Negeri Karangjati 04 before and after using e-book media assisted by augmented reality. To determine the criteria for increasing the average pretest and posttest, normality test analysis, T test, and N-gain test were used.

Normality Test

One part of testing data analysis requirements or assumption tests is the normality test. Before conducting regression analysis, the research data must be tested for normal distribution. The decision-making of the K-S normality test is based on: Research data is normally distributed if the significance value (Sig.) is greater than 0.05; Research data is not normally distributed if the significance value (Sig.) is less than 0.05.

Table 6. Results of the Normality Test

One-Sample Kolmogorov- Smirnov Test		Pretest	Posttest
N		19	19
Normal Parameters[a, b]	Mean	42.26	91.26
	Std. deviation	8.75	3.46
Most Extreme Differences	Absolute	.147	.169

One-Sample Kolmogorov- Smirnov Test			Pretest	Posttest
	Positive		.147	.169
	Negative		-.127	-.166
Test Statistic			.147	.169
Asymp Sig. (2 Tailed)[c]			.200[d]	.159
Monte Carlo Sig. (2-tailed)[a]	Sig.		.334	.160
	99% Confidence Interval	Lower Bound	.322	.151
		Upper Bound	.346	.169

a. Test istribution is normal; b. Calculated from data; c. Liliefors Significance Correction; d. This is a lower bound of the true significance; e. Liliefors method based on 10000 Monte Carlo samples with starting sees 624387341

Based on table 6, it can be seen that the significance value of Asiymp.Sig (2-tailed) has a value of 0.169 which is greater than 0.05. So, it can be concluded that the data is normally distributed. This means that the normality requirements in the regression analysis have been met.

T Test

The next step is to carry out the T Test which is part of the comparative hypothesis test or comparison test. The data used is data with an interval or ratio scale (quantitative data). The purpose of the t test is to determine whether there is a difference in the average of the two related groups. The decision making for the t test is based on the significance value (Sig.) In the SPSS output results (Santoso, 2016):H0 is rejected and Ha is accepted, if the Sig. (2-tailed) value is <0.05; H0 is accepted and Ha is rejected, if the Sig. (2-tailed) value is >0.05.

Research Hypothesis Formulation

H0 = there is no difference in the average learning outcomes of the pretest with. Thus, the use of e-books assisted by augmented reality has no effect on improving understanding and learning outcomes in the subject of science in the material of the human respiratory system in class V of SD Negeri Karangjati 04 in 2024. Ha = There is a difference in the average learning outcomes of the pretest and posttest. This means that there is an effect of the use of e-books assisted by augmented reality in improving understanding and learning outcomes for the subject of science in the material of the human respiratory system in class V of SD Negeri Karangjati 04 in 2024.

Table 7. T-Test Results

		Paired Samples test			99 Confidence Internal of the Difference				
		Paired differences							
		Mean	Std. deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Category value	65. 26	25.19	4.08	56.90	73.54	15.96	37	.001

Based on table 7, the Sig. (2-tailed) value is 0.001 <0.05, so H0 is rejected and Ha is accepted. This means that there is a difference in the average learning outcomes between the pretest and posttest. So, there is an influence of the use of e-books assisted by augmented reality in improving understanding and learning outcomes for the subject of science on the human respiratory system in grade 5 of SD Negeri Karangjati 04 in 2024.

N-gain Test

To determine the effectiveness of using the product in research with the pretest-posttest model, the N-gain score test is used which is carried out by calculating the difference between the pretest and posttest values. By knowing the difference between the pretest and posttest, it can be seen whether the use of the product can be said to be effective or not. The categorization of the N-gain score can be determined from the N-gain value in the form of a percentage (%). The following are the categories for dividing the N-gain score:

Table 8. Gain Score Distribution

N-Gain Value	Category
g > 0.70	Tall
0.30 ≤ g ≤ 0.70	Currently
g < 0.30	Low

Based on table 9, it is known that the average difference is 49 in a large-scale experiment. This shows that the class of students in class VB at SD Negeri Karangjati 04 has increased with an average of 0.85 which is included in the high criteria. This average increase shows that the use of augmented reality-assisted e-book media in science learning on the respiratory system material has succeeded in improving students' understanding which can be seen from changes in learning outcomes. This shows that augmented reality-assisted e-book media is feasible and

effective in science learning on the respiratory system material because it can improve students' learning outcomes.

Table 9. N-gain Test Results

Average Difference	N-gain	Criteria
49	0.85	High

The results of this study indicate that augmented reality-assisted e-book media is suitable for use in science learning on the respiratory system material in class VB, feasible, practical, and effective which is reinforced by several factors. First, augmented reality-assisted e-book media can create easy learning and encourage active thinking in learning (Novita, 2023; Bergmark, 2023). The use of media in learning activities can improve students' creative thinking skills (Wardani et al., 2024). The use of e-books can train critical thinking skills, increase reading interest, and improve student learning outcomes (Andriani et al., 2023; Rosmawati, 2023). E-books are an innovative learning media that can increase student learning motivation (Prasetyo & Zulherman, 2023). With various interesting and interactive features, e-books also make it easier for students to understand concepts in learning materials (Lestari & Fitria, 2023; Maulida & Zulherman, 2024) and can provide students with provisions to be able to overcome problems and find solutions (Guo et al., 2020; Almulla, 2023).

Second, augmented reality technology can develop and improve students' ability to imagine abstract images through various techniques so as to train students' imaginative abilities (Alkhasawneh & Khasawneh, 2024) and can improve students' learning achievement (Faria, 2024). Other studies show that after using augmented reality as interactive multimedia, students' critical thinking skills are better than before (Bakri et al., 2021; Zuniari et al., 2022). By projecting an object into a real form, it will provide students with a pleasant learning experience. By utilizing technology, innovations can be made in the use of media that can reduce barriers to learning and help students succeed (Amelia et al., 2024). Third, e-books assisted by augmented reality created by researchers allow students to learn independently (Hafizhah & Setyasto, 2024) and are able to improve creative thinking skills (Arzak & Prahani, 2023). E-books can also increase students' interest in learning at home (Suprapto et al., 2021). Fourth, e-books assisted by augmented reality can strengthen students' memory longer regarding the material being studied because students receive learning with visual media, also often referred to as pictures or metaphors (Salmiyanti et al., 2023). Visual media can facilitate understanding (for example through elaboration of structure and organization) and strengthen memory.

The implication of this study is that the e-book media assisted by augmented reality that has been developed can be used by teachers and students in learning so that it can improve student learning outcomes. Based on several studies related to conditions and problems in the field, researchers developed an e-book assisted by augmented reality on the respiratory system material in grade V of elementary school. Based on the results of the research and discussions that have been explained, the e-book media assisted by augmented reality is feasible, practical, and effective for use in learning.

Conclusion

The results of the data analysis showed that the augmented reality-assisted e-book media received a very feasible category with a score percentage of 90.65%. The results of the teacher and student response questionnaires on the augmented reality-assisted e-book media received a positive category. From filling out the questionnaire on the practicality of the augmented reality-assisted e-book by teachers and students, it showed that the e-book was practical with very positive criteria. The average learning outcomes of students also increased in the pretest results, which were 42.26 and the average posttest results, which were 91.26. The significant increase in the posttest results showed that the augmented reality-assisted e-book was successful in improving students' understanding and learning outcomes. This is supported by the results of the N-gain test showing a value of 0.85 which is included in the high criteria. So, by using augmented reality-assisted e-book learning media, it has been proven feasible, practical, and effective in improving students' understanding of the social sciences subject on the respiratory system material in grade V of elementary school.

Acknowledgments

Thank you to Semarang State University for providing the opportunity for researchers to complete the study. Thank you to the supervisor who has guided the entire research process and writing of the article until completion. Thank you to the experts who have validated the researcher's media by providing suggestions and input to improve the quality of the media that the researcher has developed. Thank you to SD Negeri Karangjati 04 for helping and enabling the implementation process of the research. Thank you to Mataram University for facilitating the creation of the article. Thank you to the editor who has reviewed this article. Thank you to parents, siblings, and friends who have prayed for and supported this research.

Author Contributions
S, who contributed to research, product development, data analysis, and article writing. N. S as a supervisor in research activities to article writing.

Funding
This research was funded by the researcher's personal funds and did not receive funding from external factors.

Conflicts of Interest
The researcher stated that there was no conflict in this research activity.

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