



Augmented Reality Flipbook as a Guide to Determining the Main Idea of Paragraphs in Indonesian Language Learning

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ABSTRAK

Dalam proses pembelajaran, siswa masih mengalami kesulitan dalam memahami materi dengan baik. Dalam pelaksanaannya guru menggunakan bahan ajar konvensional, kurang bervariasi dan belum berbasis digital dengan melibatkan siswa secara aktif. Tujuan penelitian ini adalah untuk mengembangkan dan menguji keefektifan flipbook berbasis augmented reality pada paragraf gagasan pokok muatan pembelajaran bahasa Indonesia di kelas V sekolah dasar. Jenis penelitian yang digunakan adalah Research & Development (R&D). Subyek penelitian ini adalah guru, 1 orang ahli media, 1 orang ahli materi, dan siswa kelas V yaitu 6 siswa uji coba awal dan 13 siswa uji coba penggunaan. Metode pengumpulan data yang digunakan meliputi observasi, wawancara, angket, dan tes. Teknik analisis data yang digunakan meliputi analisis data kualitatif, analisis data kuantitatif, uji normalitas, N-Gain, dan analisis statistik inferensial (uji-t). Hasil penelitian adalah uji kelayakan oleh ahli media memperoleh persentase 92% (sangat layak), ahli materi 91,25% (sangat layak), uji coba respon siswa dan guru memperoleh persentase 95,31%, dan 92,5% (sangat layak). bisa dilakukan). Hasil uji-t (paired t-test) diperoleh perbedaan hasil antara sebelum (pretest) dan sesudah (posttest) siswa kelas V yang menggunakan flipbook berbasis augmented reality. Hasil uji N-Gain 0,61 (sedang). Disimpulkan bahwa flipbook berbasis augmented reality sangat layak dan efektif digunakan dalam pembelajaran. Penelitian ini mengandung makna bahwa flipbook berbasis augmented reality dapat memudahkan pemahaman siswa terhadap materi pembelajaran sehingga dapat meningkatkan kemampuan kognitif siswa dalam menentukan gagasan pokok paragraf dalam pembelajaran bahasa Indonesia.

ABSTRACT

In the learning process, students still have difficulty in understanding the material well. In its implementation, the teacher uses conventional teaching materials, less varied and not yet digital-based by actively involving students. The purpose of this study was to develop and test the effectiveness of augmented reality-based flipbooks on the main idea of paragraphs of Indonesian language learning content in grade V elementary school. The type of research is the Research & Development (R&D). The subjects of this study were teachers, 1 media expert, 1 material expert, and fifth-grade students, namely 6 initial trial students and 13 usage trial students. The data collection methods used include observation, interviews, questionnaires, and tests. Data analysis techniques used include qualitative data analysis, quantitative data analysis, normality test, N-Gain, and inferential statistical analysis (t-test). The results of the study are the feasibility test by media experts obtained a percentage of 92% (very feasible), material experts are 91.25% (very feasible), student and teacher response trials obtained a percentage of 95.31%, and 92.5% (very feasible). The results of the t-test (paired t-test) obtained differences in results between before (pretest) and after (posttest) grade V students using augmented reality-based flipbooks. N-Gain test results 0.61 (medium). It is concluded that the augmented reality-based flipbook is very feasible and effective to use in learning. This research implies that augmented reality-based flipbooks can facilitate students' understanding of learning materials so that they can improve students' cognitive abilities in determining the main idea of paragraphs in Indonesian language learning.

1. INTRODUCTION

Currently, the increasing development has an impact on the development of science and technology, especially in the world of education to assist the learning process (Annisa Salsabila et al., 2023; Tantri et al., 2023). With the development of time and technology, learning activities are directed towards 21st-century learning. This learning directs students to be able to master 21st-century skills including communication, collaboration, critical thinking, problem-solving, creativity, and innovation (Lubis et al., 2023; Mantau & Talango, 2023). In addition, technology also contributes significantly to supporting the learning process optimally. Therefore, currently, the implementation of 21st-century learning is closely related to technology-based learning. The use of media sources and teaching materials in the learning process is needed to support learning activities, one of which is in Indonesian language learning. Teaching

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materials are defined as a source of material and all materials, information, tools, and texts used by teachers in carrying out the learning process based on needs and the applicable curriculum (Aisyah et al., 2020; Pujiatna et al., 2020; Widyaningrum et al., 2022).

In the application of the learning process in this increasingly developing era, the teaching materials used by teachers are also growing. This is evidenced by the existence of digital teaching materials. Digital teaching materials are books presented in digital form designed through the help of digital media and can be integrated with social networking sites with an attractive appearance by linking links that are easily used by students (G.A.P.E. Juniati et al., 2023; Rizal, 2022). The development of digital teaching materials must be adapted to technological developments to facilitate the learning process of students extensively, independently, and comprehensively (Marisa et al., 2023; A. Putra et al., 2023). In this case, teachers as educators must be able to adapt to existing changes and developments. Teachers also act as facilitators to be able to create effective learning by providing various media and teaching materials to support the learning process actively to obtain learning objectives by utilizing the role of technology in it. Therefore, the use of technology can support the improvement of the quality of education and be able to handle various problems that arise in the learning process (Setiyadi, 2023; Ade Sofyan & Amin Hidayat, 2023).

Teachers are required to be resourceful in developing interesting learning to support the development of students' knowledge and skills to achieve optimal learning objectives (Susiliastini & Sujana, 2022; Margaretha et al., 2023). Teachers also use various methods, media, and learning models that are tailored to the learning material to ensure the implementation of a good and effective learning process. The learning process will be more optimal if teachers utilize teaching materials that are used more variably and can create a pleasant learning atmosphere for students (Lestari & Sb., 2020; Rahmayanti & Nurlailiyah, 2021). But in reality, there are still many teachers who find it difficult to involve the utilization of technology to support the implementation of the learning process optimally, especially in the use of digital-based teaching materials. In line with this, previous research findings explain that there are still many teachers who have not used digital-based teaching materials. Teachers still use conventional teaching materials in the learning process so that students easily feel bored and learning becomes monotonous (Istiq'faroh & Aliyah, 2022; Rahmawati et al., 2022). Other supporting findings are the lack of knowledge teachers have about digital teaching materials and the lack of teacher skills in utilizing technology as a means of creating digital teaching materials (Martatiyana et al., 2022; Talitha et al., 2023). This refers to the results of interviews with fifth-grade teachers that teachers tend to use the lecture method and conventional teaching materials that are less varied, only limited to teacher books and student books so that they do not attract students' attention and enthusiasm for learning. Therefore, learning in the classroom becomes monotonous and boring and has implications for learning activities to be more passive and unpleasant for students. The lack of teacher materials and the utilization of teaching materials that can motivate students to be more active in participating in the learning process has implications for student learning outcomes. This affects the daily scores of grade V students on the main idea of the paragraph, which is 73.68% of students scored below the Learning Objective Completeness Criteria (KTTP).

The solution to overcome the above problems is to develop digital technology-based teaching materials. It is very important to be able to develop digital-based teaching materials that are attractive and interactive so that they can encourage student interest in learning and make it easier for students to understand the material being taught. Digital teaching materials that can be used are flipbooks. Flipbook is digital media that is systematically arranged to contain subject matter presented in the form of text, images, sound, video, and so on, making users more active and interactive (Millati & Setyasto, 2023; Sari & Ahmad, 2021). Flipbook with a digital book display has the advantage of presenting material in an attractive manner that can be operated easily by turning the page before or after (Alamanda et al., 2023; Yusuf et al., 2022). Flipbook is very flexible so it is practical to be used by students in learning. Flipbooks can be combined by involving the TPACK approach through augmented reality. Augmented reality is a technological innovation that can display objects in 3 dimensions (3D) in the virtual world and can interact or be interpreted in the real world (Arifitama, 2020; Logayah et al., 2023). Augmented reality can be used as an innovation in learning activities that can provide new and meaningful experiences for students in the learning process. In line with previous research, the use of augmented reality provides an interesting new way to gain experience knowledge, and information to help students understand the material in the learning process (Kamińska et al., 2023; Wiraha & Sudarma, 2023). Facts in the field also show that the use of augmented reality can provide a more immersive learning experience, inviting students to explore and interact with their environment (Al-Ansi et al., 2023; Tikson et al., 2023). The advantages of augmented reality in the learning process include 1) making learning more interesting and interactive, 2) making it easier for students to understand concepts, 3) easy to use, 4) can be widely implemented through various media, 5) modeling that displays objects to enrich the learning experience, and 5) does not require costs to make it (Indahsari & Sumirat, 2023; Fauziyyah, 2019).

The results of previous studies explain that flipbooks can be used optimally by teachers to support learning activities so that they can motivate students to understand the material taught in class (Amanullah, 2020; Parinduri et al., 2022). In addition, augmented reality has gained attention in education as this technology has the potential to enhance learning and teaching (Nistrina, 2021; Yamtinah et al., 2023). In line with this, other findings reveal that augmented reality technology is an innovative technology development that can be combined with flipbook media as an effort to increase learning innovation to support optimal knowledge achievement. The results of previous studies also show that flipbooks with the help of augmented reality have advantages including making it easier for students to understand and learn the material, motivating and encouraging students to improve their abilities by projecting learning materials in 3D (Atut et al., 2023; Dhahrani Al Jasmine, Rahayu S, 2024; Fitriani & Lubis, 2023; A. E. Putri & Hendriyani, 2023).

However, there has been no study of augmented reality-based flipbooks in Indonesian Language Subjects for grade V elementary school students. Therefore, in contrast to previous studies, the novelty of this research will focus more on augmented reality-based flipbook teaching materials that are used to facilitate students in determining the main idea of paragraphs through the presentation of text and objects that can be displayed with augmented reality. The purpose of this research is to develop and test the effectiveness of augmented reality-based flipbooks on the main idea of paragraphs of Indonesian language learning content in grade V elementary school. The results of this study are expected to be a reference for educators in utilizing technology as a medium for teaching materials, especially in the development of technological innovation in the current era through augmented reality.

2. METHOD

This research is a research and development (RnD) with a development model according to Sugiyono. This development model is carried out in 10 stages of research stages consisting of (1) analysis of potential and problems, (2) data collection, (3) product design, (4) design validation, (5) design revision, (6) product trial, (7) product revision, (8) trial use, 9) product revision and (10) mass production (Sugiyono, 2019). However, in this study, only 8 steps of the research stages were used from the ten stages of the development procedure. This research was conducted at SDN Podorejo 03. The subjects of this research were class teachers, 1 media expert, 1 material expert, and grade V students, namely 6 initial trial students and 13 usage trial students. The types of data used are qualitative and quantitative data. The data collection methods used in this study include observation, interviews, questionnaires, and tests. Observations and interviews were used to collect data in the form of problems obtained in the field. Questionnaires are used to collect data in the form of needs, expert assessments, and responses to the augmented reality-based flipbook developed (Martatiyana et al., 2022; Ningtyas & Rahmawati, 2023). Tests are used to measure student learning outcomes before and after using augmented reality-based flipbooks. The instrument grids can be seen in Table 1 and Table 2.

Table 1. Media Expert Instrument

No	Aspects	Indicator
1	Component	Content Component <ol style="list-style-type: none"> a. Title b. Learning materials c. Basic competencies/ Learning achievement/Indicators d. Learning instructions e. Learning objectives f. Supporting information g. Quiz h. Quiz instructions i. Assessment
2	Graphics feasibility	Display and design <ol style="list-style-type: none"> a. Color composition and selection b. Text type c. Text size d. Image/illustration e. Sound f. Background g. Layout

No	Aspects	Indicator
3	Presentation aspect	Presentation technique and cohesiveness a. Presentation of material b. Presentation of reading text c. Presentation of learning by involving students
4	User-friendliness	a. Easy to use b. Support online and offline learning c. Reusable

Table 2. Material Expert Instrument

No	Aspect	Indicator
1	Component	Content Component a. Title b. Learning materials c. Basic competencies/ Learning achievement /Indicator d. Learning instructions e. Learning objectives f. Supporting information g. Quiz h. Quiz instructions i. Assessment
2	Material feasibility	a. Suitability of CP and learning objectives b. Breadth and depth of material c. Suitability of material in teaching materials d. The material is by student development e. Suitability of the reading text with the material
3	Language	a. Grammatical correctness b. Language is appropriate for student development c. Interactive and communicative

Data analysis techniques in this study used qualitative data analysis techniques, quantitative data analysis, normality test, N-Gain, and inferential statistical analysis (t-test). Qualitative data analysis is used for data processing in the form of interview results, suggestions, and expert input on augmented reality-based flipbooks. Quantitative data analysis is used to process data related to the assessment of media and material experts as well as teacher and student responses to augmented reality-based flipbooks. Normality test analysis is used to determine whether the data obtained is normally distributed data or not. N-Gain test analysis is used to determine student improvement through pretest and posttest on the main idea of the paragraph before and after using augmented reality-based flipbooks. Inferential statistical analysis (t-test) using a paired t-test technique is used to test the hypothesis through the pretest and post-test results obtained.

3. RESULT AND DISCUSSION

Result

Based on the research and development design that has been stated, the development of augmented reality-based flipbooks on paragraph main ideas is carried out with eight stages. First, at the potential and problem analysis stage, it was found that students did not understand the main ideas of paragraphs and were less active in participating in learning activities because the teaching materials used were limited to student books. In the learning process, students find it difficult to understand the material because the teacher has not been able to explain the material effectively to students so that it is easy for students to learn. Teachers still use conventional teaching materials, less varied and not yet digital-based. Therefore, learning takes place passively and does not attract students' attention actively in the learning process. This has an impact on the acquisition of low student learning outcomes. This is reinforced by the learning results of students' daily grades on the main idea of the paragraph as many as 14 out of 19 students scored below the Learning Objective Completeness Criteria (KTTP) of 70 with a percentage of 73.68%. These results show that the learning objectives have not been achieved optimally. Therefore, teachers use digital-based teaching materials to facilitate students' understanding of the material and actively participate in participating in learning activities so that learning outcomes can be achieved optimally and improve

student learning outcomes. The learning outcomes of the Indonesian language on the main idea of paragraph material can be seen in [Table 3](#).

Table 3. Learning Outcomes of Indonesian Language Content

Element	Learning Outcomes
Reading and viewing	Learners can identify the main idea of description, narration, and exposition texts

Second, is the data collection stage. At this stage, a needs questionnaire is distributed to teachers and students. Furthermore, the results of the needs questionnaire will be used as a reference in the development of augmented reality-based flipbooks. The results obtained are that teachers and students agree that the content of the main idea of the paragraph is taught using augmented reality-based flipbooks following the composition and components in the preparation of teaching materials. Third, the product design stage. At this stage, based on the prototype and the data obtained, the augmented reality-based flipbook is designed and developed according to user needs. This stage is carried out by selecting devices and software that will be used in product development. The devices used in designing augmented reality-based flipbooks are smartphones and laptops while the software used is Canva, Heyzine, and Assembly Studio. Furthermore, at this stage, an augmented reality-based flipbook design framework was also prepared. The preparation of this product framework is used as a guide in developing products in the form of augmented reality-based flipbooks. The results of the development of an augmented reality-based flipbook framework for the main ideas of paragraphs can be seen in [Table 4](#).

Table 4. Augmented Reality-Based Flipbook Development Framework

Introduction		Core		Closing	
1	Cover of augmented reality-based flipbook	9	Paragraph main idea material	13	Bibliography
2	Menu list	10	Text analysis activities with augmented reality	14	Cover
3	Author and developer profile	11	Summary of material		
4	Preface	12	Quiz		
5	Usage guide	13	Quiz instructions		
6	Learning outcomes				
7	Learning objectives				
8	Material concept map				

Fourth, design validation, namely the results of products that have been developed will continue to be tested by media experts and material experts. At this stage, media and material experts assess the augmented reality-based flipbook that has been developed using a validation questionnaire sheet. The results of the product feasibility test by media and material experts obtained high validity with very feasible qualifications. The following is a description of the results of the validity of the assessment of media and material experts developing augmented reality-based flipbooks. The percentage of media experts was 92% (very feasible) with aspects of assessment including components, graphic feasibility, presentation of material, and ease of use. Based on the results of the media expert analysis, the suggestions and input obtained are not revisions. The percentage of material experts was 91.25% (very feasible) with aspects of assessment including components, feasibility of material, and language. Based on the results of the material analysis, the suggestions and input obtained were not revised. Fifth, design revision. At this stage, the results of the feasibility test obtained from media and material experts, suggestions, and input obtained through the validation questionnaire did not undergo revision so the augmented reality-based flipbook was very feasible to be tested in learning.

Sixth, product trials. At this stage, the results of the augmented reality-based flipbook products developed were then tested through small-scale tests on 6 students as research subjects. At this stage, pretest and posttest questions and response questionnaires were given to find out the responses of teachers and students to the augmented reality-based flipbook. Based on data analysis, the difference in average scores before (pretest) and after (posttest) using augmented reality-based flipbooks was obtained. The average pretest score was 48.66 and the average posttest score was 71.33 with student learning completeness increasing by 66%. From these results, there is an increase in learning outcomes after using augmented reality-based flipbooks in learning to determine the main idea of paragraphs. Furthermore,

based on the feasibility analysis results, teacher and student responses to the use of augmented reality-based flipbooks obtained very good qualification results, namely student responses obtained a percentage of 95.31% (very feasible) and teacher responses obtained a percentage of 92.5% (very feasible) without anything that needs to be revised. Therefore, at this stage, the augmented reality-based flipbook is very feasible to be applied in learning.

Seventh, product revision. Based on the results of the analysis of responses, suggestions, and feedback, there were no revisions so the product could be tested on a large scale. Eighth, the pilot test. At this stage, testing and experiments were carried out on 13 fifth-grade students of SDN Podorejo 03 to test the effectiveness of augmented reality-based flipbooks. The test of the effectiveness of using augmented reality-based flipbooks was also carried out using pretests and posttests. There is an increase in student learning outcomes before (pretest) and after (posttest) using augmented reality-based flipbooks. The average pretest result was 57.85 and the posttest result was 82.46 with student learning completeness increasing by 84.7%.

Based on the normality test of the pretest and posttest results of class V students using the Shapiro-Wilk test, the significance of the pretest results was 0.985 and the posttest was 0.903. Normality testing is categorized as normal if the Sig value. $> 0,05$. It was concluded that the pretest test results were $0.985 > 0.05$ and the posttest $0.903 > 0.05$, meaning that the pretest and posttest results of class V students were normally distributed. Furthermore, the t-test analysis is by using the paired sample t-test technique. Based on the results of the analysis, the t_{count} is -17.321 with a significance level of 5% with the value of $t_{tabel} = t_{(\alpha,dk)}$ is -2.179, $-t_{hitung} < -t_{tabel}$ then $-17.321 < -2.179$, meaning that H_0 is rejected and H_a is accepted, namely the use of augmented reality-based flipbooks is effective in improving student learning outcomes in Indonesian language learning on the main idea of paragraphs. Based on the results of the analysis of the average increase test or N-Gain, the value of grade V students before and after using augmented reality-based flipbooks in determining the main idea of paragraphs has increased by 0.61 (medium). Based on the data analysis above, it can be concluded that augmented reality-based flipbooks are very feasible to use in the learning process and effectively improve student learning outcomes on paragraph main ideas. The results of the development of augmented reality-based flipbooks on the main idea of paragraph material can be seen in Figure 1.



Figure 1. Augmented Reality-Based Flipbook Development Results

Discussion

Based on the results of data analysis, it can be concluded that augmented reality-based flipbooks are very feasible to use in learning and effectively improve student learning outcomes significantly. This can be seen from the difference in results between the pretest and posttest of grade V students before and after using augmented reality-based flipbooks in learning to determine the main idea of paragraph material. This difference is caused by several factors. First, the use of augmented reality-based flipbooks makes it easier for students to learn and understand the main ideas of paragraphs well because the material presented in the flipbook is arranged systematically so that the material can be clearly understood by students. The use of flipbooks in learning can increase students' interest in learning and understanding the material taught, thus enabling students to realize fun and interactive learning activities in the classroom to improve learning outcomes and students' critical thinking skills (Santia & Nurmayani, 2023; Sudiarti et al., 2023). Flipbook has the advantage of being able to convey material with an attractive display in a short time, easily accessible, and used anywhere so that it can increase students' enthusiasm and interest in learning (Juliani & Ibrahim, 2023; A. D. Putra et al., 2023).

Second, the learning process with augmented reality-based flipbooks can provide new experiences to students in learning the main idea of paragraphs by presenting reading texts in the form of augmented reality. Through augmented reality, it can make students more active by gaining direct experience to attract

students' interest in learning. In line with this, the use of augmented reality media can certainly improve the success of learning outcomes by providing new and meaningful experiences to students in the learning process (Angreni et al., 2023; Usmaedi et al., 2020). New experiences that students feel while learning can provide meaningful experiences for students. Meaningful experiences obtained by students can increase stronger memory so that the results can affect the improvement of learning outcomes (Mariantini et al., 2022; Meilindawati et al., 2023). The use of augmented reality in the learning process can attract students' attention by providing comfort when learning the material because learning has been directed to a new dimension where students can easily visualize and represent the material in depth (Estheriani & Muhid, 2020; Rukayah et al., 2022; Utomo et al., 2022). The use of augmented reality can help the learning process in the classroom by providing space for students to develop their imagination so that they can achieve successful learning outcomes (Charisma Annuritza Arliana et al., 2023; Qorimah & Utama, 2022; B. Setiawan et al., 2023).

Third, the use of augmented reality-based flipbooks can make the learning process in the classroom more interesting, active, and interactive. This has a positive impact on students' interest in actively participating in learning activities. The attractiveness of flipbooks lies in the presentation of material that is easy to understand with an electronic format that combines interactive simulations through animation, text, video, images, audio, and navigation making this interactive approach able to realize interesting, active, and fun learning to increase students' interest in learning (Dzakiyah et al., 2023; Nafiah et al., 2023). In line with previous research findings, flipbooks are feasible and practical to use in learning and effective in significantly improving learning outcomes (A. D. A. Putri & Sumardi, 2022; Salahuddin et al., 2023; Yulaika et al., 2020). The results of other studies also state that the use of augmented reality in learning can maximize learning outcomes and student self-efficacy (Crew et al., 2022; Helen et al., 2023; Nuraini, 2023; Sapulette, 2023). The results of previous studies also state that the development of augmented reality-based teaching materials is one of the innovations to change the form of teaching materials into digital form by utilizing augmented reality technology in the learning process (Fatih et al., 2023; I. Setiawan & Martin, 2023).

From the research results obtained, supported by some previous research results, it can be concluded that augmented reality-based flipbooks have a high value of validity with qualifications that are very feasible for use in learning and effectively improve student learning outcomes significantly. The advantages of augmented reality-based flipbooks attract students' interest in learning and provide meaningful real experiences in the learning process by utilizing technology. The limitation of this study is that this research was only conducted with 8 stages. In addition, this research only focuses on the content of the main idea of paragraphs in Indonesian language learning in grade V. Therefore, it can be an opportunity for improvement and innovations for further research with other subject matter or content. This research implies that augmented reality-based flipbooks can facilitate students' understanding of learning materials to improve students' cognitive abilities in determining the main idea of paragraphs in Indonesian language learning.

4. CONCLUSION

Augmented reality-based flipbooks on paragraph main idea material get very good validity from experts, teachers, and student responses. Based on the results of data analysis, there are differences between before (pretest) and after (posttest) grade V students before and after using augmented reality-based flipbooks. It is concluded that augmented reality-based flipbooks are very feasible and effective for use in the Indonesian language learning process. The use of augmented reality-based flipbooks can increase students' interest in learning material with new experiences gained, can make the learning process more interesting and students become more active and interactive. In addition, the use of augmented reality-based flipbooks can facilitate students' understanding of the material taught to improve students' cognitive abilities in determining the main idea of paragraphs in Indonesian language learning in elementary schools.

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