DEVELOPMENT OF AUGMENTED REALITY-ASSISTED ZIG-ZAG BOOK MEDIA IN NARRATIVE WRITING LEARNING IN ELEMENTARY SCHOOL

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PENGEMBANGAN MEDIA *ZIG-ZAG BOOK* BERBANTUAN *AUGMENTED REALITY* DALAM PEMBELAJARAN MENULIS NARASI DI SEKOLAH DASAR

ARTICLE HISTORY	ABSTRACT
	Abstract: *This paper discusses 1) development of a zig-zag book assisted by augmented reality to improve students' narrative essay writing skills that meet the eligibility criteria according to the experts and 2) to determine the effectiveness of a zig-zag book assisted by augmented reality in improving writing narrative essay skills for fourth-grade elementary students. The research method used is Research and Development with the ADDIE model. The research subjects were fourth-grade elementary students in Semarang. Data collection techniques used interviews, questionnaires, scales, tests, and performance. Data were analyzed by descriptive analysis, dependent sample t-test with prerequisite test for normality and homogeneity tests, and n-gain. The research results reveal that the media were considered very feasible to use by media and material experts. In addition, the developed media was also effective in improving the writing narrative essay skills based on the n-gain value of 0.65 with the moderate improvement category. Thus, the Zig-Zag book media assisted by Augmented Reality can be recommended to be applied in improving narrative essay writing skills of fourth-grade elementary students.*
	Keywords: zig-zag book, augmented reality, narrative writing, elementary students
	Abstrak: *Artikel ini membahas 1) pengembangan *zig-zag book* berbantuan *augmented reality* untuk meningkatkan keterampilan menulis karangan narasi siswa yang memenuhi kriteria kelayakan menurut para ahli dan 2) mengetahui keefektifan *zig-zag book* berbantuan *augmented reality* dalam meningkatkan keterampilan menulis karangan narasi siswa kelas IV Sekolah Dasar. Metode penelitian yang digunakan adalah Penelitian dan Pengembangan dengan model ADDIE. Subyek penelitian adalah siswa kelas IV Sekolah Dasar di Kota Semarang. Teknik pengumpulan data menggunakan wawancara, angket, skala, tes, dan unjuk kerja. Data dianalisis dengan analisis deskriptif, uji-t sampel dependen dengan uji prasyarat uji normalitas dan homogenitas, dan n-gain. Hasil penelitian menunjukkan bahwa media dinyatakan sangat layak oleh ahli media dan materi. Selain itu, media yang dikembangkan juga efektif dalam meningkatkan keterampilan menulis karangan narasi dilihat dari nilai *n-gain* sebesar 0,65 dengan kategori peningkatan sedang. Dengan demikian, media *Zig-Zag Book* dengan bantuan *Augmented Reality* dapat direkomendasikan untuk digunakan dalam meningkatkan keterampilan menulis karangan narasi siswa kelas IV Sekolah Dasar.*

Kata Kunci: zig-zag book, augmented reality, menulis narasi, siswa sekolah dasar |

INTRODUCTION

Technological developments are currently very massive and evenly distributed for various aspects of life, one of which is the aspect of education as one of the basic abilities of humans or Homo sapiens to be intelligent and knowledgeable through curiosity about all things that are not yet known in their environment. Humans with all the complexities in them are driven by their need to achieve something, one of which is education as an absolute need that must be fulfilled until the end of their lives. This is guaranteed by the state in Article 28C paragraph (1) of the Constitution of the Republic of Indonesia which states that every individual has the right to receive education and benefit from science and technology, arts, and culture, to maximize the quality of life and for the sake of the welfare of humanity. In addition, Law Number 20 of 2003 concerning the National Education System which is in line with the 1945 Constitution stipulates that the national education system is democratic and fair which is intended with the intention that all Indonesian people have equal opportunities to obtain quality education according to their abilities and their respective talents. This is realized by the government through the Freedom to Learn Program stated in the Strategic Plan of the Ministry of Education and Culture 2020-2024 for the development of access to quality, just and inclusive education, so that human resources are formed that are able to keep up with changing times with the advantages obtained through quality education (Hakim, 2016; Khunaifi & Matlani, 2019).

Elementary school education is one level of education realized by the government through the 12-year Compulsory Learning Program. At this level of education, students are encouraged to master 8 fields of study. One of the compulsory subjects in elementary schools is Indonesian. Based on the Indonesian graduation competency standards, after taking this subject, students are expected to be able to have listening skills, speaking skills, reading skills, and writing skills. Language skills are a benchmark in knowing the quality of language knowledge possessed by individuals. In learning activities, language skills are needed by students to understand the learning information conveyed by the teacher so that they can solve existing problems. Proficiency in language skills can be an initial capital in empowering students who are literate or have basic literacy (Linggasari & Rochaendi, 2022). In addition, language skills can develop 21st century capabilities, including critical thinking, creative thinking, communication skills, collaborative learning, and higher order thinking skills (Ramandanu, 2019).

However, it turns out that access to Indonesian language education still faces obstacles which result in a decrease in the quality of human resources as seen from the parameter of the reading ability of every school-age child in Indonesia according to the international standard PISA (Progamme For International Student Assessment). This can be seen from the results that education in Indonesia ranks in the bottom 10 on a global scale in 2018 with the reading ability of school-age children in Indonesia who get an average score of 371 or only about 30% of school-age children in Indonesia who are able to achieve a level of reading literacy at the level 2 and above, which percentage is very far from the average target set by the OECD of 77%, and very behind other Asian countries such as China and Singapore which reach level 2 and above by more than 85% (OECD, 2019).

The trend in Indonesia's score when compared to the 2015 PISA assessment tends to decrease. This provides clear evidence that the strategy adopted by the government in

2016 through the implementation of the Literacy Movement to foster students' interest in reading has not yielded satisfactory results. These results are the impact of low interest in reading and writing literacy (Setiawan et al., 2019) which is feared will result in Indonesian human resources being unable to compete in facing challenges in the current era of modernization.

Literacy activities that have been carried out so far are still focused on reading literacy activities, so that in their output students lack creativity and critical thinking skills. Reading and writing literacy activities have not been considered as activities that are a major requirement for students in Indonesia. As an effort to optimize the Literacy Movement, which can produce individuals with character, it is necessary to provide attractive, varied, and innovative technology-based reading materials that are in accordance with the development of students.

Previously, research had been carried out to improve narrative essay writing skills such as research from Tantikasari et al. (2017) and Siddik (2018) on the effectiveness of picture series media in writing narratives for elementary school students. However, the use of picture series has not been able to accommodate the use of technology in learning. Another research that is also related to writing narratives in elementary school is by Witdiatmoko (2016) using video media from Video Compact Disk (VCD). Even though it is effective in improving narrative writing skills and has fulfilled the elements of technology in learning, it is not relevant for current use. Therefore, researchers develop media that combines concrete media with technology. One of the innovations offered in this article to answer the above problems is through the development of zig-zag book media with the help of augmented reality in teaching narrative writing in elementary schools. This is also supported by the massive development of technology and science which supports the

elusively of Indonesian language education and education which can meet the needs and in accordance with the development of an increasingly complex world through the development of critical thinking ways to identify problems, analyze, solve problems, and communicate and interpret ideas effectively in everyday life (Listyani, 2019).

LITERATURE REVIEW
Learning Media

Learning media is an important element in the learning process. Learning media is something that is utilized in the distribution of messages and is used to attract attention, feelings, and students' abilities to encourage the process of learning activities (Nurrita, 2018). Meanwhile, learning media is a teaching aid that is used as a support in the process of teaching activities by teachers (Sasmito & Sekarsari, 2022). Meanwhile, according to Arsyad learning media is something that is used to convey information or messages in the process of teaching activities that can help attract students' attention and interest in learning (Arsyad, 2017). Learning media can be used by teachers to broaden students' insights with various uses of learning media that can facilitate the process of transferring knowledge to students. Learning media is needed to help increase student interest in the process of teaching and learning activities, through the delivery of learning materials that are easy to understand. Interesting types of learning media will help increase students' interest in understanding the material well (Dlis et al., 2020). Therefore, the presence of learning media is needed in the process of teaching and learning activities. In this case, teachers are required to be able to wisely choose the type of learning media that is in accordance with the learning objectives to be achieved.

Learning media has an important role for the quality of the teaching and learning process (Ahmad Zaki, 2020). Learning media

helps the development of student psychology in learning. Choosing the right learning media can help students understand things that are abstract to be more real or concrete (Magdalena et al., 2021). Selection of appropriate learning media helps increase students' desire and motivation to learn. For elementary school students, learning media is a very important thing because by using the right learning media students' learning motivation can increase. For elementary school students who have just studied the scientific world, various subjects taught at school are new and foreign to students. Therefore, the right learning media can be used as communication that helps simplify material so that it can be easily understood (Ahmadi et al., 2020).

Zig-Zag Book

Zig-zag book media is a type of tool in the language learning process that contains pictures and story content about pictures on a large cardboard in a zig-zag shape (Wachidah & Wati, 2019). Zig-zag book can also be defined as a book made with the aim of helping improve students' skills and interest in writing (Synta, 2015). The zig-zag book is a medium that has a lot of positive values because the content is attractive to students and can be easily used in the learning process, and is easy to manufacture (Komalasary et al., 2019). In addition, the zig-zag book also has a sequence marker that helps make it easier for students to use it. The characteristics of a zig-zag book that has a sequence can help students to be trained in making narrative essays sequentially according to the series of events that occur in the stories they make. Even though it has many benefits, the use of this media is still rarely used in the learning process (Elkin & Mistry, 2022). In fact, zig-zag book media is one type of learning media in language learning activities which has an important role in improving students' skills and interest in writing (Ramos, 2019).

In writing narrative essay skills, the zig-zag book can be chosen as a medium that can help increase students' creativity in writing. The zig-zag book media is made by folding paper so that it is shaped like the letter Z. The size itself can be adjusted to the needs of students. Its easy use and attractive visuals can be used as writing medium for students. This media is suitable for use as a learning medium for Indonesian language subjects because it is easy to use to attract interest and improve students' writing skills (Agustina, 2017). Making the zig-zag book medium is very easy because the teacher only needs to prepare the HVS paper and fold it in half, then fold it in half again, then the teacher can fold the top of the paper back out as well as the bottom of the paper. After that, the teacher can write a short story sequentially on each blank sheet of paper and add illustrations to make the zig-zag book media look more attractive. The teacher can also invite students to write their own stories on the zig-zag book media.

Augmented Reality (AR)

Augmented Reality or commonly abbreviated as AR is a technology that can be used to combine two-dimensional or three-dimensional virtual objects in a real three-dimensional form, then these virtual or virtual objects are projected in real time. In contrast to Reality in the virtual world which completely replaces the real world, Augmented Reality helps add or complement Reality. In these virtual objects there is information that cannot be received directly by the senses of the user. Therefore, Augmented Reality is needed to help user interaction and perception with the real world. With the help of Augmented Reality, this information can be displayed to the user. In other words, Augmented Reality can also be defined as a combination of real and virtual objects in a real form (Jang et al., 2021). Augmented Reality also allows integration between these objects in a three-dimensional form (Usmaedi et al., 2020).

Merging between real and virtual objects can be done with the use of appropriate technology, through the help of certain input devices that assist the integration of the merger. Basically, Augmented Reality operates according to image detection in the form of markers (ÇALIŞIR et al., 2022).

Augmented Reality is a type of digital technology that is widely used in the current era of the industrial revolution 4.0. AR is widely used in rendering digital content into real life. Production is carried out with the help of cameras and real-world captures in real time which will then be incorporated into digital content with the aim of expanding content information to more users (Lampropoulos et al., 2020). Augmented Reality itself was discovered from 1957-1962 by Norton Heilig, a cinematographer (Sa'idah et al., 2019). Therefore, the invention is named a simulator tool that is used to simulate vibrations, smells, and visuals. In the process of teaching and learning activities themselves, Augmented Reality is used as a learning medium. This technology is used to combine the real world and the virtual world into a two-dimensional or three-dimensional form that is projected into the real environment at the same time between the real world and the virtual world (Mubai et al., 2020). The use of Augmented Reality helps activities to be more interactive, effective, and can be widely utilized with various media uses. Object modeling is simple, doesn't cost a lot, and is easy to use (Sáez-López et al., 2019). Furthermore, this has been proven by a study, Eldokhny & Drwish (2021) states that based on research on the application of AR in the teaching and learning process conducted by Billinghurst and Dunser in 2012 it was found that study groups using Augmented Reality media had better learning outcomes. better than study groups using conventional learning media. This happens because AR media helps students understand the material more concretely.

Writing Narratives in Elementary Schools

Narrative is one type of literary work that contains various aspects in a series of stories that contain meaning. According to Inggriyani & Fazriyah (2018) narrative is a story that has a systematic and chronological sequence of events. In general, narrative stories contain life stories of characters that can inspire readers. In other words, a narrative story is a type of story that can inspire someone's feelings to imitate and emulate the characters in the story (Ahsin, 2016). In making narratives, a writer should have in-depth knowledge of narratives. The writing process itself requires ideas, thoughts, and feelings that can be put into writing (Siddik, 2018). The process of writing a narrative also requires good reasoning in preparing the story concept to be written. In writing narratives, writers must also be able to write narratives with an appropriate sequence of events based on the point of view they use (Fitriana et al., 2021).

At the elementary school level, writing narratives is one of the lessons of writing (Hermansson et al., 2019). The process of learning to write narratives is an important thing to help improve students' writing skills and help students to express themselves (Ulu, 2019). Students' writing ability can be developed through creative writing skills (MS, 2014). In the process of writing narratives, creativity is needed by students to create something new in the story (Gina et al., 2017). Narrative writing activity is an activity that is carried out by pouring ideas coherently based on the author's real experience which is expressed in the form of a sequence of events. The ability to write narratives is one of the students' skills in communicating a fact or event that they have experienced in a sequence of time based on the chronological flow of events. These facts are conveyed in an interesting and easy-to-understand language style for readers.

RESEARCH METHODS

This study applies the research and development (R and D) method with the ADDIE development design consisting of five stages. The five stages of the research include, 1) analysis stage, 2) design stage, 3) development stage, 4) implementation stage, and 5) evaluation stage (Ghofur & Youhanita, 2020). The first stage is analysis, at this stage an analysis of the needs of students and teachers is carried out for the development of instructional media for writing narrative essays. The second stage is design. At this stage a media design is prepared which is developed from the results of the needs analysis in the previous stage. The next stage is development. At this stage the design of learning media that has been compiled is then developed into a learning media prototype which is then tested for feasibility by experts. The fourth stage is implementation, after being corrected according to suggestions and declared feasible by experts, the developed learning media is then applied in the learning process of writing narrative essays. The last stage is evaluation, at this stage it is used to assess the learning media that has been developed by looking at student and teacher responses as a reference in improving it before later disseminating it.

The subjects in this study were fourth grade elementary school students at SD Negeri Pudakpayung 01 Semarang City in the 2021/2022 academic year. The total population of the study was 56 students, with a sample of 28 students consisting of 15 female students and 13 male students. Sampling was carried out using cluster random sampling technique. Research data was obtained through various techniques, namely questionnaires, scales, and tests. There are three instruments in this study. The first instrument is in the form of a questionnaire analyzing the needs of teachers and students. The second is in the form of a feasibility assessment sheet of learning media (media experts and material experts). Finally,

the third instrument is in the form of an assessment rubric for writing narrative essays.

The research data were analyzed using two techniques, namely qualitative and quantitative analysis techniques. Qualitative analysis uses descriptive analysis to present learning media feasibility data obtained from the conversion of quantitative data which is qualitative into several qualitative categories. Quantitative data in this study were in the form of pre and posttest results of writing narrative essays. The results of the narrative essay writing test were analyzed using dependent t-test analysis to see differences in narrative essay writing skills before and after applying the developed media. The dependent t-test can be carried out if it meets the prerequisite tests in the form of normality tests and homogeneity tests.

RESULTS AND DISCUSSION

The results of the study are presented in three discussions which include needs analysis, the feasibility of augmented reality-assisted zig-zag book media and the effectiveness of augmented reality-assisted zig-zag book media in improving students' narrative writing skills. The following describes the results obtained in this study.

Learning Media Needs Analysis

The implementation of media needs analysis aims to gather information related to the need for the development of Zig-Zag Book media assisted by Augmented Reality in improving the skills of writing narrative essays for elementary students. Needs analysis activities are carried out by carrying out interviews with teachers and students, as well as distributing questionnaires analyzing the needs of teachers and students. The results of the needs analysis show that the learning media used by teachers to support literacy activities in schools have varied, such as pictures, textbooks, and story books. The teacher has never utilized and operated the

augmented reality assisted zig-zag book media. Both of these are new things and have never been used by the school in supporting literacy movement programs in elementary schools. Students' narrative essay writing skills are still not optimal. Students find it difficult when asked to write a story because of limited vocabulary. Students also still have difficulty distinguishing narrative essays from descriptive essays. The use of capital letters and punctuation marks is also often wrong. This happens because writing literacy activities are still limited to being carried out in schools which are more dominated by reading activities. Media literacy that supports the improvement of narrative essay writing skills is not yet available. Thus, teachers and students need the development of instructional media that supports the narrative writing skills of grade IV SD students.

Eligibility of Augmented Reality Assisted Zig-zag Book Media

The zig-zag book media with the help of augmented reality is the result of the development of the zig-zag book media which is equipped with a barcode that supports AR technology. AR technology in the zig-zag book media is used to make it easier for students to listen to stories in visual and audio forms contained in the zig-zag book media. The use of this media is by scanning each barcode sequentially to be able to listen to the stories contained in the media. Integrating AR technology into this media can attract students' attention to be able to improve their writing skills, especially in writing narrative essays. The appearance of the zig-zag book media with the help of augmented reality can be seen in Figures 1 and 2 below.

Figure 1. AR-assisted Zig-zag Book Cover Page

Figure 2. AR-assisted Zig-zag Book Contents Page

The AR-assisted Zig-zag Book learning media has gone through an evaluation process of feasibility analysis and validation from content experts and media experts. The assessment results for the AR-assisted Zig-zag Book learning media for material and media validators are presented in Tables 1 and 2 below.

Table 1. Material Expert Analysis

No	Indicator	Score
1	Valid (Material suitability with students' goals and characteristics)	23
2	Importance Level (Supports Learning)	18
3	Learnability (Use of language and storyline integration)	27
4	Attract Interest (Motivates and fosters creativity)	13
5	Usefulness	9
	Total Score	**90**

Table 1 shows that material experts assess the content on the AR-assisted zig-zag book media classified in the "Very Eligible" criteria with a score of 90 and a percentage of 90%. The aspects of assessing material in teaching this media are in terms of validity, level of importance, learnability, interest and usefulness for evaluation tools. Furthermore, media experts then carry out an assessment of the AR-assisted zig-zag book media as follows.

Table 2. Media Expert Analysis

No	Indicator	Score
1	Consistency (Spacing, font size and layout are consistent)	8
2	Format (Writing and Layout)	13
3	Practicality	23
4	Attractiveness	33
5	Interactivity	12
	Total Score	**89**

Meanwhile, based on table 2, the assessment of learning media experts is in a proper classification with a score of 89 and a percentage of 89%. The assessment aspects of the AR-assisted Zig-zag Book learning media are in the aspects of display consistency, format, practicality, media attractiveness, and interactivity.

The Effectiveness of Media Zig-zag Book assisted by Augmented Reality

The influence of the Zig-zag Book learning media assisted by Augmented Reality was obtained from performance tests in the form of pretest and posttest before and after using the media. Researchers carried out an effectiveness test on the Zig-zag Book media assisted by Augmented Reality through large group testing. Activities carried out by students in large group testing are the same as small group testing. The following are the differences in narrative and story writing skills before and after using the Zig-zag Book media assisted by Augmented Reality in large group testing.

Table 3. Effectiveness of AR-assisted Zig-zag book media

No	Indicators	Results	
		Pretest	*Posttest*
1	Number of Samples	28	28
2	Mean	60,5	85,4
3	Min. Scores	56	78
4	Max. Scores	88	95

The Zig-zag Book learning media assisted by Augemented Reality is effective in improving narrative essay writing skills as evidenced by a difference of 24.9 with a dependent t test of 0.000 <0.05 and an n-gain score of 0.65 with the criterion of moderate improvement in narrative essay writing skills. Responses from testing in large groups (students) obtained a good 95% and teacher responses with a score of 90%. The results of the responses from teachers and students showed that the Zig-zag Book media assisted by Augemented Reality developed by researchers received very good responses.

Zig-zag Book assisted by Augemented Reality Media Improved Narrative Writing Skills of Elementary School Students

Before the Zig-zag Book learning media assisted by Augemented Reality is developed, an analysis of the needs of students and teachers is carried out in literacy activities in schools related to improving the skills of writing narrative essays. Needs analysis is done online. The development of the Zig-zag Book learning media with the help of Augemented Reality was carried out because it was in accordance with the conditions of SD Negeri PudakPayung 01 which required variations and other alternative literacy media to improve narrative essay writing skills and creative thinking. The learning media developed by researchers is assisted by Augemented Reality through smartphones. The reason for choosing a smartphone is because it is easy to carry, wireless, contains many applications, making it easier for students to do many tasks at once, and can be installed easily (Ningrum et al., 2021). Another reason for

using smartphones is that they are able to expand the learning environment which is a trend that provides learning experiences that are easier to transmit (Adesti & Nurkholimah, 2020).

The results showed that it was proven that the Zig-zag Book learning media assisted by Augemented Reality could improve the skills of writing narrative. Besides that, mobile devices can also be used to stimulate motivation, strengthen student involvement in increasing student creativity and writing skills (Pamungkas, 2020). The application of the Zig-zag Book learning media assisted by Augemented Reality has passed the material and media tests and it is stated that the Zig-zag Book learning media assisted by Augemented Reality is very suitable for use in the experimental or trial stages.

Experiments have been carried out, and obtained positive results, the Zig-zag Book literacy media assisted by Augemented Reality got an average posttest score that was higher than the pretest and based on the acquisition of t test scores and the n-gain value of the Zig-zag Book learning media assisted by Augemented Reality effective in improving the skills of writing narrative essays and creative thinking and getting positive responses from teachers and fourth grade students at SD Negeri Pudak Payung 01.

CONCLUSIONS AND RECOMMENDATIONS

Based on the data obtained from the research, it can be concluded that the process of developing the Zig-zag Book learning media with the help of Augemented Reality is carried out in 4 stages, namely Analysis,

Design, Development, Implementation, Evaluation. Based on the results of the feasibility test, stated that the Zig-zag Book learning media assisted by Augemented Reality obtained very appropriate criteria from both media experts and material experts. The Zig-zag Book learning media assisted by Augemented Reality is effective in improving the ability to write narrative essays for fourth grade elementary school students and gets positive responses from teachers and students. Suggestions that can be given are that grade IV teachers can apply the Zig-zag Book learning media assisted by Augemented Reality as one of the literacy media in teaching writing narrative essays and students' creative thinking. In addition, to obtain more comprehensive trial results, the addition of research samples can be multiplied and expanded. Other variables related to the affective domain or attitude can be used as a study in further research.

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18

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