Journal of Educational Research and Evaluation
Volume 8, Issue 3, 2024, pp. 462-472
P-ISSN: 2597-422x E-ISSN: 2549-2675
Open Access: https://doi.org/10.23887/jere.v8i3.76515

Audible Book Based on Pancasila Student Profile as a Media for Introduction Quadrilateral for Elementary Students

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ARTICLE INFO

Article history:
Received March 17, 2024
Accepted July 29, 2024
Available online August 25, 2024

Kata Kunci :
Buku Audiensi Matematika, Literasi Numerasi, Profil Siswa Pancasila, Segi Empat

Keywords:
Mathematics Audible Book, Literacy Numeracy, Pancasila Student Profile, Quadrilateral

ABSTRAK

Perkembangan teknologi merambat ke semua sektor, termasuk bidang pendidikan. Sebagai tenaga pendidik diharuskan untuk memanfaatkan teknologi dalam pembelajaran, banyak siswa mengalami kesulitan memahami materi geometris, yang sering kali disampaikan dengan cara konvensional dan kurang menarik. Di sisi lain, pendidikan di Indonesia juga bertujuan untuk membentuk karakter siswa yang sesuai dengan nilai-nilai Pancasila, seperti gotong royong, integritas, dan kemandirian. Namun, pendekatan yang mengintegrasikan pendidikan karakter dengan pengajaran mata pelajaran masih terbatas. *Penelitian ini bertujuan menganalisis mathematics audible book berbasis profil pelajar pancasila yang layak dan praktis sebagai media pengenalan bangun datar segi empat untuk siswa kelas IV SD dengan memanfaatkan perkembangan teknologi. Penelitian menggunakan model ADDIE. Subjek uji siswa kelas IV SD, melibatkan 94 siswa dan 3 guru. Teknik pengumpulan data melalui wawancara dan angket. Analisis data menggunakan indeks aiken'v. Hasil penelitian menunjukkan secara keseluruhan penggunaan mathematics audible book layak dan praktis sebagai media pengenalan bangun datar segi empat untuk kelas IV SD. Implikasi penelitian ini adalah* Buku ini dirancang untuk memperkenalkan konsep segi empat dengan cara yang menarik dan sesuai dengan profil siswa Pancasila, yang menekankan nilai-nilai seperti gotong royong, integritas, dan kemandirian.

ABSTRACT

Technological developments are spreading to all sectors, including education. As educators, we are required to utilize technology in learning, Many students have difficulty understanding geometric material, which is often presented in a conventional and less interesting way. On the other hand, education in Indonesia also aims to shape students' character in accordance with Pancasila values, such as mutual cooperation, integrity and independence. However, approaches that integrate character education with subject teaching are still limited. This research aims to analyze a mathematics audible book based on Pancasila student profiles that is feasible and practical as a medium for introducing rectangular flat shapes for fourth grade elementary school students by utilizing technological developments. The research uses the ADDIE model. The test subjects were fourth grade elementary school students, involving 94 students and 3 teachers. Data collection techniques through interviews and questionnaires. Data analysis uses the Aiken'v index. The results of the research show that overall the use of a mathematics audible book is feasible and practical as a medium for introducing rectangular shapes for class IV elementary school. The implications of this research are This book is designed to introduce the quadrilateral concept in an interesting way and in line with the Pancasila student profile, which emphasizes values such as mutual cooperation, integrity and independence.

1. INTRODUCTION

Currently we have entered the era of Society 5.0. In this era, all human activities rely on technology and modernization in various fields(Chalim, 2022; Oktaviani et al., 2021) In facing the era of Society 5.0, the world of education needs to be proactive. Education plays an important role as the vanguard of individuals in facing the challenges of this age (Soim Daimah, 2023; Zhang, 2023). The challenges of this era require students to be competitive and master 6 basic literacies, one of which is numeracy literacy(Nadjamuddin & Hulukati, 2021; Syaifuddin, 2022). In the educational context, the curriculum functions as a foundation for educators to guide students according to their needs (Bosowa & Prov, 2020; Haleem et al., 2020). The curriculum developed must reflect innovation and accommodate the demands of the times, thereby improving the quality of education and creating a generation that is ready to face future competition. The Merdeka Curriculum emerged as a response to the intense competition between individuals in the Society 5.0 era (Aisy et al., 2020; Supa'at & Ihsan, 2023; Wannesia et al., 2022).

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The concept of this era utilizes modern technology while still relying on the role of humans as the main component. The Independent Curriculum approach allows schools to adapt their curriculum more flexibly to the needs of students and the surrounding community (Aisy et al., 2020; Marlina, 2022; Suryati, 2021). The Merdeka Curriculum is a solution to the low ability of Indonesian students in the PISA test . Because, the Merdeka Curriculum is simpler and deeper, with a focus on essential material according to the student's competency phase. However, despite this policy, Indonesian students' numeracy literacy skills are still relatively low. Based on the results of the 2022 PISA test, Indonesia's mathematics literacy ranking is ranked 12th from the bottom, out of 81 countries (Mahdawanty et al., 2022; Naibaho et al., 2023). Previously, in PISA 2018, Indonesia was ranked 7th from the bottom, out of 79 countries. Even though the 2022 PISA test results have improved by rising 5 positions, they still show a low category. PISA not only measures how well students master the knowledge acquired in the school environment but also how well they can apply these skills to solve challenges in everyday life(Iswara et al., 2023; Naibaho et al., 2023).

Based on observations carried out in March 2023 by interviewing 10 teachers from 8 elementary schools in Yogyakarta. It turns out that studying is not just enough with ordinary printed books. Teachers need to innovate the books that will be used as learning by students, so that learning becomes interesting, fun, and provides new experiences for students. Based on interviews, information was also obtained that students' mathematical abilities were still low. So, through the innovation of mathematics learning books in the form of audio books, it is hoped that learning can be made more meaningful. If students are interested in learning, it is possible that learning can take place effectively. Based on this, media will also be developed that includes mathematical material as a media for numeracy literacy in introducing rectangular shapes. This is related to previous research which states numeracy literacy abilities because numeracy literacy is an individual's ability to carry out mathematical reasoning for solving problems in everyday life. (Arahmah et al., 2021; Prijowuntato & Widharyanto, 2022; Syaifuddin, 2022). And previous research also revealed that literacy is closely related to language, while numeracy is closely related to mathematics, so that numeracy literacy can be interpreted as the ability to reason with both language and mathematics. (Anita Dian Pratiwi et al., 2023). Solving mathematical problems also relies on students' numeracy literacy skills, especially on problems related to daily life where students need to analyze information, process it, and draw conclusions to make decisions (Alotaibi et al., 2021; Arifin, 2022). Therefore, efforts are needed to improve students' numeracy literacy skills which are very important in the 21st century educational era. It is also important to know that mathematics plays an important role as a foundation, reference or guide for various other scientific disciplines (Fajari, 2020; Kartiko et al., 2020). The low numeracy literacy skills of Indonesian students can be triggered by various factors, one of which is the limited availability of interesting books that contain mathematical concepts in both print and digital formats (Luthfiani et al., 2020; Putra et al., 2020).

As for the novelty of this research lies in the integrative approach used, combining the teaching of mathematical concepts with character formation based on Pancasila values. So far, existing learning media tend to separate academic teaching and character education, so that students do not get a holistic learning experience. This book is innovative because it is designed to convey quadrilateral material in an interesting and relevant method, while simultaneously instilling values such as mutual cooperation, integrity and independence. Apart from that, this book also uses an audience format, which invites students to be more active and involved in the learning process. This approach is expected to increase student motivation and understanding, as well as form strong characters in accordance with the Pancasila Student profile. Thus, this research provides a new contribution in the development of learning media that is not only academically effective, but also plays a role in forming students' superior character and integrity.**.** The development of the Audible Mathematics book will be based on the values contained in the Pancasila student profile. This is in line with the curriculum currently used by schools, namely the Merdeka Curriculum, with the core of the Merdeka Curriculum being the Pancasila student profile (Irawati et al., 2022; Sujadi, 2022; Susanti et al., 2020). Furthermore, mathematical solving is more than just mastering the numeracy aspect; also includes mental aspects such as freedom of thought, skill development, judgment ability, accuracy, orderliness, rationality, patience, independence, discipline, perseverance, resilience, self-confidence, open-mindedness, and creativity. Uncertain These elements are in accordance with the values contained in the Pancasila student profile. Understanding the Pancasila student profile can start from 6 basic literacy skills as a preparation for facing the competitive era, one of which is numeracy literacy (Kartiko et al., 2020; Marlina, 2022; Nadjamuddin & Hulukati, 2021; Syaifuddin, 2022). Through learning that strengthens literacy and numeracy, it will be supported to create students who have the character profile of Pancasila students (Arifin, 2022; Naibaho et al., 2023). Next, the material that will be developed in the Audible book is about quadrilaterals. This is in line with the preliminary study carried out, it was found that there are still many students who experience

misconceptions about rectangular shapes, where students think that quadrangles are only limited to squares and rectangles. Therefore, in this research the researcher will develop an Audible Book with illustrations and sound based on the values of the Pancasila student profile. With this Audible Book, it is hoped that it can attract students' attention in reading so that they can understand the information presented in the book. It is hoped that the use of Audible Books in learning can function as a means of introducing rectangular material to students. Therefore, this research will be entitled "Development of an Audible Book Based on Student Profiles. The aim of this research is that this book is designed to not only increase students' understanding of geometric material, but also to instill Pancasila values such as mutual cooperation, integrity and independence. This research aims to create interesting, interactive and contextual learning media, so that it can increase student motivation and involvement in the learning process. Apart from that, this research also aims to provide tools for teachers to convey material in a more creative and effective way. Overall, the ultimate goal of this research is to improve the quality of basic education in Indonesia by integrating character education into academic learning, thereby producing a young generation who is not only intellectually intelligent, but also has strong character and is in accordance with the values of Pancasila.

2. METHODS

This research uses Research and Development (R&D) methodology. In this development research, researchers used the ADDIE development model (Analyzing, Design, Developing, Implementing, and Evaluating). The ADDIE model involves evaluation of development activities at each stage (Bosowa & Prov, 2020; Chalim, 2022). The trial will be conducted with fourth grade students. The audible mathematics media trial consisted of four stages: one-to-one evaluation with 5 students at Jumeneng State Elementary School; Small group evaluation with 20 students and 1 teacher at Lor Jumeneng Public Elementary School; Large-scale trials were carried out on class IV students at SD Negeri Sendangadi 1 and Sinduadi 1, totaling 47 students and 2 teachers. Data is an important element that supports answering questions, testing hypotheses, and achieving research objectives. The type of data used in this research is primary data. The techniques used for data collection were interviews and questionnaires. Interviews in this research were conducted to collect information to analyze needs as a basis for research and development of Audi mathematics books. The questionnaire used in this research includes validity and practicality questionnaires. The validity questionnaire will be distributed to validators including media experts and subject matter experts. Practicality questionnaires will be given to teachers and students.

The data analysis carried out in this development is descriptive statistics. Descriptive statistics are used to describe and analyze respondent responses from the questionnaire. To determine the validity of the media, the weight of each response obtained from the questionnaire will be calculated. Validation data analysis is carried out to find out whether the product being developed is suitable to proceed to the next stage. The formula used for this validation test is the Aiken's V index. The average score interval for validator assessments is presented in Table 1.

Table 1. Validator Rating Average Score Interval

Average Index Score	Validity Category
V > 0.8	Very Valid
0,4 ≤ INSIDE ≤ 0,8	Legal
V <0.4	Less Valid

This research procedure begins with the Analysis stage, where students' and teachers' needs for innovative learning media are identified through surveys and interviews. Next, at the Design stage, the audience book structure and learning content were developed based on the Pancasila student profile and the quadrilateral concept. In the Development stage, an audience book was created and integrated with Pancasila values and rectangular material, accompanied by illustrations and interactive activities. The Implementation Phase involved trialling the book in several elementary schools to see how students and teachers used and responded to this media. Finally, in the Evaluation stage, the effectiveness of the audience book is evaluated through data collection from student comprehension tests, classroom observations, and teacher feedback. The results of this evaluation are used to improve the book, ensuring that learning objectives are achieved and that Pancasila values are well integrated in the teaching process.

3. RESULT AND DISCUSSION

Results

Audible Mathematics books are developed according to the ADDIE model. The ADDIE model stages consist of five steps: analysis, design, development, implementation, and evaluation. The product development stage begins with media needs analysis, media needs analysis according to student characteristics, analysis of the curriculum used in schools, and literature review as supporting theory. At the needs analysis stage, interviews were conducted with 10 teachers from 8 elementary schools in Yogyakarta. Based on interviews, it was found that schools lack innovation in mathematics textbooks, and mathematics teaching in schools still relies only on textbooks. Apart from that, schools do not yet use digital illustrated mathematics books. Based on interviews with several class teachers, the subjects of this research were fourth grade elementary school students. Based on student analysis, fourth grade elementary school students are around 9-10 years old. According to Piaget, children aged 7-11 years are still in the concrete operational cognitive development stage, a transition from concrete to abstract thinking. The Mathematics Audience Book presents colorful illustrations, in line with the characteristics of elementary school age students who tend to like colorful and pictorial material. The curriculum analysis carried out in this research was adapted to the curriculum used by schools that adopt the Merdeka Curriculum. The material discussed in this mathematics audiobook is about quadrilaterals, including their types and properties.

The next stage is designing an audible mathematics book which includes making book illustration sketches, coloring the sketches, arranging the book format, adding audio to the book, and designing evaluation tools. After this design stage, the math audiobook will be converted into an application for Windows and Android devices for offline access without an internet connection. Apart from that, audible mathematics books will also be available in e-book form which can be accessed online if connected to the internet. Through this e-book, mathematics textbooks can be accessed online on all devices, including Windows, Android and iOS. The Mathematics Audience Book developed in this research is a mathematical story book about quadrilaterals which includes their types and properties. This book contains colorful illustrated math stories with audio features. The story used to introduce the mathematical material in this book revolves around the adventure of quadrilaterals. Through this quadrilateral adventure story, students will be trained in numeracy literacy, where they will explore and discover quadrilaterals in everyday life, analyze problems, look for solutions, and draw conclusions.

This book also contains values from the six dimensions of the Pancasila student profile. The Pancasila student profile values are integrated into the narrative of mathematics material. The internalization of values in the context of mathematics learning needs to start from an early age, especially at the elementary school level. Next, product feasibility validation is carried out from an expert perspective. Expert reviews are carried out by media experts and material experts in their respective fields. The purpose of this validation stage is to obtain input and suggestions from media experts and material experts regarding the development of audible mathematics book products. Input from media and subject matter experts helps minimize errors in the development of audible mathematics book products when applied to fourth grade elementary school students. Validation of mathematics textbook products in this research was carried out by one media expert lecturer and two subject matter experts consisting of lecturers and teachers. The following are the results of the development of an audible mathematics book. Audible books are presented in Figure 1. Figure 2. and Figure 3

Figure 1. Audible Mathematics Book Cover

Figure 2. Rectangle Material

Figure 3. Pancasila Student Profile Values

After the media goes through a validation process in three stages, the media expert lecturer then fills out a final assessment questionnaire regarding the suitability of the media. A recapitulation of the results of the final assessment of media suitability from media experts is presented in Table 2.

Table 2. Validity Results from Media Experts

No.	Assessment Aspects	Rating Result	Category
1	Readability and Audibility	1.00	High Validity
2	Illustration Quality	1.00	High Validity
3	Color Compatibility	1.00	High Validity
4	Material	1.00	High Validity
5	Media Use	1.00	High Validity
	Average	**1.00**	**High Validity**

Furthermore, validation was also carried out by subject matter experts consisting of one lecturer and one elementary school teacher. The product material validation process is carried out in two stages by material expert lecturers. This validation process is carried out by researchers to perfect the product according to the validator's suggestions. Media validation makes it possible to minimize product errors, ensuring the media meets valid criteria to be applied in the classroom during learning. After the media goes through two stages of validation by subject matter expert lecturers and one stage by elementary school teachers, material experts fill out a final assessment questionnaire regarding the suitability of the media. A recapitulation of the results of the final assessment of media suitability from material experts is presented in Table 3.

Table 3. Subject Matter Expert Validity Results

No.	Assessment Aspects	Rating Result	Category
1	Content Quality	0.94	High Validity
2	Accuracy	1.00	High Validity
3	Presentation	0.92	High Validity
4	Language usage	1.00	High Validity
	Average	**0.96**	**High Validity**

Based on the feasibility assessment from subject matter experts and media experts as validators, it was concluded that the audible mathematics book could be continued to the next stage, namely testing on elementary school students. Next, a practicality test was carried out starting with a one-on-one test. One-to-One Test, also known as Individual Test, is an evaluation step carried out after the product is deemed valid based on assessments from media experts and material experts. This test involves individual assessment. In this One-to-One test, five elementary school students were selected to participate. From the results of the one-to-one test, it can be concluded that all participants A, B, C, D, and E expressed their liking for the Audible Book display which contains mathematics material with additional pictures and sounds. Additionally, they found Audible Books easy to use, and they were able to understand the language used in math audiobooks. Participants A, B, C, D, and E also stated that they were able to understand the mathematics material presented through the audible mathematics book. They also expressed their joy in using audible mathematics books. They also show joy and interest if teachers use mathematics audiobooks in the mathematics teaching process.

From the One-to-One test results, it can be concluded that students find the appearance of the Audible Mathematics Book attractive because of its bright visuals and audio. Children can also easily understand the material presented. They have no difficulty understanding concepts and using the Mathematics Audible Book platform. If teachers use Mathematics Audible Book media to help students learn mathematics, students will also feel enthusiastic and happy. Students are interested in the Mathematics Audible Book media because it makes learning mathematics more fun and introduces them to new media that they can use in learning mathematics in elementary school. After the One-to-One test, it was continued with a small-scale trial, a small-scale trial was carried out at SDN Jumeneng Lor Yogyakarta. In this small group, the sample subjects consisted of 20 fourth grade students and one elementary school teacher. This activity was carried out to obtain review data from students and teachers regarding the Mathematics Audible Book media which was developed as a media practicality test. The initial activity carried out by the researcher was to explain what an Audi mathematics book is. Next, it explains how to use and what features are available in the audible mathematics book. Then the researcher began to explain the media of mathematics audio books. Media presentation uses a projector displayed in front of the class. The media is operated by students in turns in front of the class. After using the media, students were given a response questionnaire to test the practicality of the audible mathematics book media. The practicality test results are presented in Table 4.

Table 4. Small Group Student Test Results

No.	Aspect	Percentage (%)	Information
1	Attract	92.33	Practical
2	Ease of use	96.66	Practical
3	Benefit	94.72	Practical
	Total	**94.57**	**Practical**

Based on the results of media practicality test calculations, it can be concluded that the media as a whole falls into the "Practical" category for small group student trials. Practicality test response questionnaire sheets were also given to elementary school teachers. The results of the practicality test on elementary school teachers are presented in Table 5.

Table 5. Small Group Teacher Test Results

No.	Aspect	Percentage (%)	Information
1	Attract	93.75	Practical
2	Ease of use	100	Practical
3	Benefit	100	Practical
	Total	**97.91**	**Practical**

Based on the results of media practicality test calculations from teacher responses, it can be concluded that the media as a whole falls into the "Very Practical" category. Likewise, teacher comments on the practicality response questionnaire regarding media explained that the use of mathematics audio books can attract students' attention and increase their enthusiasm for learning. After completing trials on a small scale, the next step is to carry out trials on a larger scale, which is called a large-scale trial. Large group trials were carried out in two schools, namely SDN Sinduadi 1 and SDN Sendangadi. The large group trial participants consisted of 47 grade IV students and 2 grade IV teachers. The initial activity carried out

by the researcher was to explain what a mathematics listening book was. Next, it explains how to use and what features are available in the audible mathematics book. Then the researcher began to explain the media of mathematics audio books. Media presentation uses a projector displayed in front of the class. Media operations by students are carried out in groups. Students were divided into 5 groups, and each group was given one tool to operate the mathematics audiobook. The devices used to operate Audible Books consist of laptops, iPads and smartphones. Students will use an audible mathematics book while being guided by researchers. After using the mathematics audible book media, students were given a response questionnaire to test the practicality of the mathematics audible book media. The results of students' practicality calculations are presented in Table 6.

Table 6. Large Group Student Test Results

No.	Aspect	Percentage (%)	Information
1	Attract	85.67	Practical
2	Ease of use	82.69	Practical
3	Benefit	81.91	Practical
	Total	**83.42**	**Practical**

Based on the results of media practicality test calculations, it can be concluded that the media as a whole falls into the "Practical" category for large-scale student trials. Practicality test response questionnaire sheets were also given to 2 elementary school teachers. References for the results of teacher practicality in large groups are presented in Table 7.

Table 7. Large Group Teacher Test Results

No.	Aspect	Percentage (%)		Information
		Teacher I	Teacher II	
1	Attract	81.25	100	Practical
2	Ease of use	95.00	100	Practical
3	Benefit	93.75	100	Practical
	Total	**95.00**		**Practical**

Based on the results of practicality tests on large-scale groups, it can be concluded that overall the media is in the "Very Practical" category for both large-scale student and teacher trials. Overall, the media is categorized as "Very Practical" for trials involving teachers and small-scale groups. Teacher assessments show that mathematics textbooks have an appeal that stimulates students' interest in using them in learning. Apart from that, this media is considered easy to use and useful for both students and teachers. The use of audible mathematics books also provides an innovative learning experience, especially in the context of mathematics learning, and can support the development of students' numeracy literacy in recognizing quadrilaterals.

Discussion

Audible Mathematics Books are illustrated mathematics books accompanied by sound. This book presents a visual display complete with audio. Audible mathematics book media can be classified as static audio-visual media. Static audio visual media is media that displays sound and still images such as sound slides and printed sound. Through the use of media in learning, effective learning can be achieved (Irawati et al., 2022; Magdalena et al., 2022) Audible Mathematics books are presented with colored visual images according to the characteristics of elementary school students. Color is the most important aspect for visual appearance that will stimulate the eye (Julianto et al., 2019). With Audible Mathematics Books in image, sound and text format, students can gain a better understanding than from regular books or books that only sound without text (James et al., 2019; Kim, 2021). Audible Mathematics Books come in audio-visual format, so they can be read and listened to. Through media equipped with audio and visual elements, information processing can be faster. This is in line with the statement of Richard E. Mayer, an American educational psychology expert, who stated that efficient learning tends to occur when material is presented in multimedia format, combining text, images and sound. (Gabriela, 2023; Halim et al., 2021). Internalizing students' Pancasila profile values in listening books can be a solid foundation in developing students' character during school and in social interactions (Arifin, 2022; Sulastri et al., 2022; Suryatin & Sugiman, 2022). Incorporating Pancasila student profile values into student books can also be seen as an innovation in mathematics education (Marlina, 2022; Naibaho et al.,

2023). Innovation in mathematics education is an effort to strengthen students' numeracy literacy. Numeracy literacy is an individual's ability to understand, use, formulate, apply, think critically and creatively in various contexts, including mathematical reasoning to describe, explain and predict phenomena in everyday life to make the right decisions. Understanding the profile of Pancasila students can start from 6 basic literacies as preparation for facing the competitive era, one of which is numeracy literacy (Marlina, 2022; Yayuk et al., 2023). Through learning that strengthens numeracy literacy, it will support the creation of students with the character of the Pancasila student profile (Naibaho, Simangunsong, et al., 2022). Mathematics learning also emphasizes the importance of achieving learning outcomes that are in accordance with the characteristics of Pancasila students, which are not only limited to cognitive aspects but also include affective and psychomotor aspects (Dwi et al., 2023; Naibaho et al., 2023)

Numeracy literacy is very important because it allows individuals to understand the role or use of mathematics in everyday life (Iswara et al., 2022; James et al., 2019). Audible Mathematics books are not just about mastering mathematical formulas or calculations but also about understanding how to use mathematics in everyday life, as well as students' ability to solve problems and make decisions based on a strong understanding of mathematics. The technique of instilling values through internalization involves combining or uniting attitudes, standards, or behavior contained in the values in mathematics learning with the values contained in the Pancasila student profile, both content and process. In developing this mathematics textbook, it is necessary to test its effectiveness statistically. Based on the results of the effectiveness test, it shows that mathematics textbooks based on Pancasila student profiles can be used as a medium to strengthen students' numeracy literacy in understanding quadrilaterals. Mathematics audio-visual books are included in the audio-visual media category. Through audio-visual media, it can facilitate students' understanding by providing visual and auditory learning. Mayer, an American psychologist, believes that there are two pathways of information processing in students, namely the verbal pathway (related to text and words) and the non-verbal pathway (involving images, animations, and sounds), which, if utilized effectively, will bad impact on students. will improve understanding (Garba, 2020; Halim et al., 2021). Through media that presents audio and visual elements, long-term memory retention in children tends to increase as well (Cahyaningtyas, 2019; Yus & Saragih, 2023) The difference in the average score between the control and experimental classes resulted in a higher average score for the experimental class. Mathematics textbooks equipped with stories and various problem solving exercises can be used to strengthen students' numeracy literacy (Kartiko et al., 2020; Trisnawati et al., 2020). The selection of suitable media must also be in line with student characteristics. Considering the characteristics of elementary school students, suitable media can be music, pictures, storytelling, playing and being creative. Through math audiobooks, all these aspects are integrated by presenting illustrated math storybooks accompanied by activities such as finding quadrilaterals and drawing shapes.

The use of picture books can improve students' reading skills and learning motivation (Primamukti & Farozin, 2018; Saptono, 2023; Utomo, 2018). Problem-based story books can also improve students' mathematical problem-solving abilities and self-confidence (Gunawan et al., 2019; Rindengan, 2023; Suryatin & Sugiman, 2022) Storybooks equipped with illustrations can also help students think critically and creatively. The application of media is still categorized as quite effective, this may be due to various factors such as limited access to devices (laptops, tablets, smartphones), causing some students to experience problems in accessing information and interacting with learning material. Adequate facilities and infrastructure are very important for the success of the learning process (Baehaki, 2023). The application of technology in education must be supported by adequate infrastructure (Savitri & Astiti, 2019). Student interest can decrease if learning facilities are inadequate, thereby potentially hampering students' access to information (Bosowa & Prov, 2020; Sari et al., 2020; Yanti, 2021). In line with previous research which revealed that the use of visual book media was effective in improving the numeracy literacy skills of elementary school students. Other research also shows that through the medium of illustrated mathematics books, numeracy literacy skills can be improved (Mahdawanty et al., 2022; Purwaningrum et al., 2021). Other research reveals that audio-visual media can improve elementary school students' learning outcomes (Gabriela, 2021). Likewise, research reveals that it is important for teachers to innovate in teaching creatively, incorporating Pancasila values to strengthen students' numeracy literacy, which will ultimately support the formation of students who meet the Pancasila student profile (Gabriela, 2023; Ibad, 2019; Sujadi, 2022). Furthermore, research revealed that Pancasila profile values need to be instilled from an early age, and one way is through numeracy literacy activities. This research has several important implications in the field of basic education in Indonesia. This book is designed to introduce the quadrilateral concept in an interesting way and in line with the Pancasila student profile, which emphasizes values such as mutual cooperation, integrity, and independence. With this approach, it is hoped that students will not only understand mathematics

material in more depth, but also internalize essential moral and ethical values. Using this book can increase student involvement in the learning process, making them more motivated and active in learning. Apart from that, this book also supports teachers in delivering material in a more creative and effective way, which in turn can improve the overall quality of education. Thus, this research has the potential to create a learning environment that is holistic and oriented towards the formation of superior student character, in line with national education goals. The limitations of this research include several aspects. First, this research may be limited to a relatively small and specific sample of students and schools, so the results may not be fully representative of the broader population. Second, the limited time for testing and implementing this audience book may not be enough to see its long-term impact on student understanding and character formation. Additionally, limitations in resources, such as access to technology and other supporting materials, may impact the book's effectiveness in various school contexts. The recommendation is that further research with larger and more diverse samples needs to be conducted to test the effectiveness of this book in various educational settings. Long-term evaluation is also needed to assess the ongoing impact of using this audience book on students' academic understanding and character development. In addition, developing training for teachers to maximize the use of this book in teaching can increase its effectiveness. Researchers are also advised to develop a digital version of this audience book so that it can be accessed more widely and overcome resource limitations in various schools.

4. CONCLUSION

This mathematics listening book product, which was developed based on the Pancasila student profile, is considered very suitable for introducing rectangular shapes to fourth grade elementary school students. This conclusion is supported by high validity scores from both media experts and content experts. Apart from that, this product has proven to be practical and effective for use by both students and teachers. Therefore, it is recommended that teachers adopt this mathematics textbook as an alternative learning resource in the independent curriculum, especially for teaching the types and properties of rectangular shapes in class IV. Integrating these tools into the curriculum can enhance the learning experience and provide valuable additional resources for students. In addition, mathematics textbooks are recommended for future media that introduce quadrilaterals, and researchers can continue to develop interactive media for a more interesting and effective learning experience.

5. REFERENCES

Aisy, S. R., Safitri, R., & Rustam. (2020). Penerapan Kurikulum Merdeka Belajar Dalam Menghadapi Era Society 5.0 Di Smp N 7 Kota Jambi. *Literasi: Jurnal Ilmiah Pendidikan Bahasa, Sastra Indonesia Dan Daerah*, *14*(1), 130. https://doi.org/10.23969/literasi.v14i1.10287.

Alotaibi, A., Education, M. O., & Arabia, S. (2021). Praktik Mengajar Guru Matematika Laki-Laki dan Perempuan Menurut Kerangka PISA dan Kaitannya dengan Keyakinannya terhadap Siswanya. *Pendidikan Dasar Online*, *20*(1), 1247–1265. https://doi.org/10.17051/ilkonline.2021.01.126.

Arahmah, F., Banindra Yudha, C., & Ulfa, D. M. (2021). Peningkatan Kemampuan Literasi Numerasi pada Matematika Melalui Metode Student Facilitator and Explaining. *Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara III Semnara*, *1*(2), 209–218.

Arifin, A. (2022). Profil Siswa Pancasila Melalui Pendidikan Matematika. *Jurnal Hukum Rusia*, *11*(3), 35. https://doi.org/10.52783/rlj.v11i3.1957.

Bosowa, B. U., & Prov, W. B. (2020). Pengembangan Kurikulum Berbasis Kebutuhan Peserta Didik dan Kehidupan Global dalam Konteks Indonesia. *Edumaspul: Jurnal PendidikanJurnal Pendidikan*, *4*(2), 449–460.

Cahyaningtyas, A. S. (2019). Pembelajaran Menggunakan Augment Reality Untuk Anak Usia Dini Di Indonesia. *Jurnal Teknologi Pendidikan : Jurnal Penelitian Dan Pengembangan Pembelajaran*, *5*(1), 20 10 33394 5 1 2850.

Chalim, K. H. A. (2022). Konsep Pembelajaran Pai Di Era Society 5.0. *Pendidikan*, *6*(2), 133–145.

Dwi, D. N. U. R., Dorisno, D., & Frasandy, R. N. (2023). Internalisasi Nilai Dalam Pembelajaran Matematika Untuk Melatih Profil Pelajar Pancasila Peserta Didik SD/MI. *Jurnal Penelitian Pembelajaran Matematika Sekolah*, *7*(1), 28–36. https://ejournal.unib.ac.id/JPPMS/article/view/27177.

Fajari, U. N. (2020). Analisis Miskonsepsi Siswa pada Materi Bangun Datar dan Bangun Ruang. *Jurnal Kiprah*, *8*(2), 113–122. https://doi.org/10.31629/kiprah.v8i2.2071.

Gabriela, N. D. P. (2023). Pengaruh Media Pembelajaran Berbasi Audio Visual Terhadap Peningkatan Hasil Belajar Sekolah Dasar. *Mahaguru: Jurnal Pendidikan Guru Sekolah Dasar*, *2*(1), 104–113. https://doi.org/10.33487/mgr.v2i1.1750.

Garba, A. (2020). Pengaruh Audio Visual Dalam Pengajaran Dan Pembelajaran Matematika Di Sekolah Menengah Terpilih Di Makurdi Metropolis, Negara Bagian Benue, Nigeria. *Int. Jr Ilmu & Aplikasi Matematika*, *10*(1), 2230–9888.

Gunawan, G., Suhardi, S., & Makawawa, J. C. (2019). Mengembangkan Media Pembelajaran Buku Cerita Bergambar Ditinjau dari Keterampilan Berpikir Kritis dan Kreatif Siswa. *Jurnal Prima Edukasia*, *11*(2), 161–175. https://doi.org/10.21831/jpe.v11i2.56795.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2020). Memahami peran teknologi digital dalam pendidikan: Sebuah tinjauan. *Operasi Dan Komputer Berkelanjutan*, *3*(2), 275–285. https://doi.org/10.1016/j.susoc.2022.05.004.

Halim, A., Yosanny, A., & Soegandi, A. (2021). Efektivitas Prinsip Redundansi dalam Presentasi Perkuliahan. *ComTech: Aplikasi Komputer, Matematika Dan Teknik*, *3*(2), 901 10 21512 3 2 2319.

Ibad, W. (2019). Penerapan Profil Pelajar Pancasila Di Tingkat Sekolah Dasar. *JIEES: Jurnal Pendidikan Islam Di Sekolah Dasar*, *3*(2), 84–94.

Irawati, D., Iqbal, A. M., Hasanah, A., & Arifin, B. S. (2022). Profil Pelajar Pancasila Sebagai Upaya Mewujudkan Karakter Bangsa. *Edumaspul: Jurnal Pendidikan*, *6*(1), 1224–1238. https://doi.org/10.33487/edumaspul.v6i1.3622.

Iswara, H. S., Ahmadi, F., & Ary, Dd. (2022). Keterampilan Literasi Numerasi Siswa Sekolah Dasar Melalui Pemecahan Masalah Berbasis Etnomatematika. *Ilmu Sosial Interdisipliner*, *2*(2), 1604–1616. https://doi.org/10.55324/iss.v2i2.316.

Iswara, H. S., Ahmadi, F., & Ary, Dd. (2023). Keterampilan Literasi Numerasi Siswa Sekolah Dasar Melalui Pemecahan Masalah Berbasis Etnomatematika. *Ilmu Sosial Interdisipliner*, *2*(2), 53. https://doi.org/10.55324/iss.v2i2.316.

James, W., Elston, D., & Dkk, T. J. (2019). Literasi Numerasi Dalam Pembelajaran Matematika Sekolah Dasar. *El Midad : Jurnal Jurusan PGMI*, *15*(2), 175–187.

Kartiko, M. Z. P., Widodo, W., & Madlazim, M. (2020). Pengembangan E-Book Isi Cairan Statis untuk Meningkatkan Kompetensi Literasi Numerasi Siswa. *Studi Dalam Filsafat Sains Dan Pendidikan*, *3*(3), 127–139. https://doi.org/10.46627/sipose.v3i3.304.

Kim, N.-Y. (2021). E-Book, Audio-Book, atau E-Audio-Book: Pengaruh Berbagai Modalitas pada Pemahaman EFL. *Pengajaran Bahasa Inggris*, *76*(4), 33–52. https://doi.org/10.15858/engtea.76.4.202112.33.

Luthfiani, U., Saragih, S., Suanto, E., & Maimunah. (2020). Analisis Kemampuan Literasi Numerik Siswa SMP pada Materi Set. *Numerical: Jurnal Matematika Dan Pendidikan Matematika*, *7*(1), 111–120. https://doi.org/10.25217/numerical.v7i1.2896.

Magdalena, I., Shodikoh, A. F., & Pebrianti, A. R. (2022). Pentingnya Media Pembelajaran Untuk Meningkatkan Minat Belajar Siswa Sdn Meruya Selatan 06 Pagi. *EDISI : Jurnal Edukasi Dan Sains*, *3*(2), 312–325. https://ejournal.stitpn.ac.id/index.php/edisi.

Mahdawanty, K., B., F., N., S., Syam, N., & Hastati, S. (2022). Pengaruh Penggunaan Media Visual Buku AKM Terhadap Hasil Literasi Numerasi Siswa SDIT Al-Hikmah Pangkep Kecamatan Pangkajene Kabupaten Pangkajene dan Kepulauan. *DIKDAS MATAPPA: Jurnal Ilmu Pendidikan Dasar*, *5*(3).

Marlina, T. (2022). Urgensi Dan Implikasi Pelaksanaan Kurikulum Merdeka Pada Sekolah Dasar/Madrasah Ibtidaiyah. *Prosiding SNPE FKIP Universitas Muhammadiyah Metro*, *1*(1), 67–72.

Nadjamuddin, A., & Hulukati, E. (2021). KemampuanLiterasi Numerasi Mahasiswa dalam Menyelesaikan Masalah Matematika. *Jurnal Basicedu*, *6*(1), 987–996. https://doi.org/10.31004/basicedu.v6i1.1999.

Naibaho, T., Simangunsong, V. H., & Sihombing, S. (2023). Penguatan Literasi Numerasi untuk Mendukung ProfilPelajarPancasilasebagaiInovasiPembelajaranMatematika. *SEPREN: Jurnal Pendidikan Matematika Dan Terapan, Edisi Khusus*, *111*(117), 100. https://doi.org/10.36655/sepren.v3i2.

Oktaviani, C., Alim, J. A., Antosa, Z., & Hermita, N. (2021). Pengembangan Audible Books Berbasis Etnomatematika Sebagai Media Literasi Untuk Siswa Di Sekolah Dasar. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *11*(3), 2464–2478. https://doi.org/10.24127/ajpm.v11i3.5355.

Prijowuntato, S. W., & Widharyanto, B. (2022). Pengaruh Keterampilan Literasi dan Numerasi Terhadap Keberhasilan Mahasiswa Fakultas Keguruan. *Jurnal Pendidikan Ilmu SosialPrijowuntato, S. W., & Widharyanto, B. (n.d.). Pengaruh Keterampilan Literasi Dan Numerasi Terhadap Keberhasilan Mahasiswa Fakultas Keguruan. Jurnal Pendidikan Ilmu Sosial, 32(63), 173–188.*, *32*(63), 173–188.

Primamukti, A. D., & Farozin, M. (2018). Pemanfaatan multimedia interaktif untuk meningkatkan minat belajar dan prestasi belajar anak. *Jurnal Prima Edukasia*, *6*(2), 111–117. https://doi.org/10.21831/jpe.v6i2.19183.

Purwaningrum, A. P., Kusmanto, A. S., Ahyani, L. N., & Purwoko, R. Y. (2021). Pengembangan Media Buku Matematika Bergambar Untuk Meningkatkan Kemampuan Literasi Numerasi Siswa Kelas Iv Sekolah Dasar. *Pendidikan*, *7*(2). https://doi.org/10.24269/ed.v7i2.2394.

Putra, Z. H., Witri, G., & Syahrilfuddin. (2020). Matematika Dan Kebudayaan Melayu Dalam Buku Bergambar Matematika Berjudul "Gelang Lucu Buatan Layang-layang." *Jurnal Mutiara Pendidikan Tersedia*, *5*(1). http://e-journal.sari-mutiara.ac.id/index.php/JRH%0apendahuluan.

Rindengan, M. (2023). Pemanfaatan Buku Cerita Bergambar: Apakah Dapat Meningkatkan Kemampuan Berpikir Kritis dan Kreatif Siswa? *Jurnal Prima Edukasia*, *11*(2), 176–185. https://doi.org/10.21831/jpe.v11i2.56854.

Saptono, B. (2023). Efektivitas E-Book dalam Pembelajaran: Analisis Tren di Sekolah Dasar. *Jurnal Prima Edukasia*, *11*(2), 206–214. https://doi.org/10.21831/jpe.v11i2.59484.

Sari, S. Y., Gusmania, Y., & Hasibuan, N. H. (2020). Pengembangan Komik Digital Sebagai Media Literasi Numerasi. *PYTHAGORAS: Jurnal Program Studi Pendidikan Matematika,PYTHAGORAS: Jurnal Program Studi Pendidikan Matematika*, *12*(1), 85–94.

Soim Daimah, U. (2023). Pembelajaran Matematika pada Kurikulum Merdeka dalam Mempersiapkan Peserta Didik di Era Society 5.0. *SEPREN: Jurnal Pendidikan Matematika Dan Terapan*, *04*(02), 131–139. https://doi.org/10.36655/sepren.v4i1.

Sujadi, I. (2022). Inovasi Pembelajaran Matematika Yang Menguatkan Literasi Dan Numerasi Untuk Mendukung Profil Pelajar Pancasila. *Prosiding MAHASENDIKA*, *22*(22), 1–13.

Sulastri, S., Syahril, S., Adi, N., & Ermita, E. (2022). Penguatan pendidikan karakter melalui profil pelajar pancasila bagi guru di sekolah dasar. *JRTI (Jurnal Riset Tindakan Indonesia*, *7*(3), 583. https://doi.org/10.29210/30032075000.

Supa'at, S., & Ihsan, I. (2023). Tantangan Pendidikan Dasar di Era Society 5.0. *Jurnal Internasional Pembelajaran Sosial (IJSL*, *3*(3), 341–360. https://doi.org/10.47134/ijsl.v3i3.214.

Suryati, D. (2021). Efektivitas Penggunaan Kurikulum Merdeka Belajar Sebagai Pengganti Kurikulum 2013 Dalam Dunia Pendidikan. *Konsep: Jurnal Sosial Humaniora Dan Pendidikan*, *2*(4), 142–152.

Suryatin, S., & Sugiman, S. (2022). Buku komik untuk meningkatkan kemampuan pemecahan masalah matematis dan rasa percaya diri siswa sekolah dasar. *Jurnal Prima Edukasia*, *7*(1), 58–72. https://doi.org/10.21831/jpe.v7i1.10747.

Susanti, M., Rahmadona, T., & Fitria, Y. (2020). Studi Literatur: Perbedaan Penilaian Kurikulum 2013 dengan Kurikulum Merdeka. *Jurnal Basicedu*, *7*(1), 339–350. https://doi.org/10.31004/basicedu.v7i1.4444.

Syaifuddin, M. (2022). Asesmen Kompetensi Minimal Untuk Mengukur Literasi Matematika Siswa SMP. *Jurnal Penelitian Dan Evaluasi Pendidikan*, *6*(2), 316–326. https://doi.org/10.23887/jere.v6i2.46263.

Trisnawati, T., Puastuti, D., & Sholeha, L. (2020). Pemilihan Media Pembelajaran Terbaik Sebagai Sarana Pembelajaran yang Efektif Menggunakan Metode SAW. *Jurnal Penelitian Ilmu Pendidikan*, *13*(1), 72–84. https://doi.org/10.21831/jpipfip.v13i1.30474.

Utomo, F. B. B. (2018). Mengembangkan buku cerita bergambar untuk meningkatkan keterampilan membaca permulaan dan motivasi belajar. *Jurnal Prima Edukasia*, *6*(2), 118–128. https://doi.org/10.21831/jpe.v6i2.16456.

Wannesia, B., Rahmawati, F., & Azzahroh, F. (2022). Inovasi Pembelajaran Kurikulum Merdeka di Era Society 5 . 0. *Media Penelitian Pendidikan: Jurnal Penelitian Dalam Bidang Pendidikan Dan Pengajaran*, *16*(2), 232–234. https://doi.org/10.26877/mpp.v16i2.13479.

Yanti, N. F. (2021). Analisis Faktor-Faktor yang Menghambat Minat Belajar Dimasa Pandemi Covid-19 pada Siswa SDN 008 Salo. *Jurnal Pendidikan Tambusai*, *5*(1), 608–614.

Yayuk, E., Restian, A., & Ekowati, D. W. (2023). *Literasi Numerasi dalam Kerangka Kurikulum Mandiri Berbasis Pendidikan Seni* (Vol. 7, Issue 2, pp. 228–238).

Yus, A. A., & Saragih, P. C. (2023). Pengaruh Penggunaan Media Audiovisual terhadap Kemampuan Bahasa Ekspresif Anak Usia Dini. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *7*(2), 1509–1517. https://doi.org/10.31004/obsesi.v7i2.3186

Zhang, W. (2023). Peran Pendidikan Berbasis Teknologi dan Pengembangan Profesi Guru dalam Kelas Bahasa Inggris sebagai Bahasa Asing. *Perbatasan Dalam Psikologi*, *13*(3), 155. https://doi.org/10.3389/fpsyg.2022.910315.