



The Need for Flipbook Media for Building Space Material in Elementary School Mathematics Learning

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ABSTRACT: This study describes the needs of flipbook media for learning mathematics with the material of building space. The purpose of this research is to describe the needs of flipbook media for learning mathematics with elementary school space building material. The type of research is descriptive qualitative. The data source is math learning with geometry material. data collection through questionnaires and interviews. The results showed that flipbook media is needed for learning mathematics because it has facilities that easily arouse motivation to learn, making flipbook content is easy and does not require large storage space, and can be learned at any time according to circumstances.

KEYWORDS: Building space, Flipbook media, Learning math.

INTRODUCTION

Post-Covid-19 Pandemic learning has an impact on the utilization of various media. The utilization of the media is essentially to facilitate learning or to facilitate the way of building lesson concepts. Learning media is any form of means or tool used to convey information or messages in the learning process (Azikiwe: 2007). Musfiqon (2012: 28) reveals that the purpose of using learning media is to help teachers convey learning materials more clearly, interestingly, effectively. Learning media can be in the form of real objects, images, sound, video, or a combination of these various elements.

Learning media functions as a tool that helps deliver information to be more easily understood by students (Cahyono, 2019). This statement emphasizes that learning media can facilitate learning by presenting information through various sensory channels, such as vision, hearing, and touch, besides that learning media can help communication between teachers and students or between students and the learning material itself.

One of the media that is currently attractive and continues to be developed is Flipbook media. Flipbook is a form of print media consisting of a series of images arranged in sequence. Riyanto (Asrial, et al, 2019) explains that flipbook is a three-dimensional digital book or e-book technology that is currently in great demand by the public. This emphasizes that, the notion of three dimensions, means that electronic books are able to present many interesting elements. Such as: the addition of videos that with one click will rotate then can be filled with animation, especially moving animation. Another facility is the sheet feature in the flipbook that can be opened like opening a printed book sheet. If an ordinary e-book can only be read by shifting the cursor or scrolling up and down. Then in the flipbook the user just swipes the finger to the side, either to the right or to the left to go to the next page.

Asrial, et al, (2019) explain that there is a characteristic that when the flipbook is rotated quickly the images give the illusion of movement or animation. This facility provides the benefit that Flipbook can be used as a simple entertaining tool or to present information visually. Although more traditional, flipbooks have a special appeal because of their ability to provide a dynamic visual experience. This is also confirmed by Selvi, et al, (2016) that Flipbook consists of a number of pages or sheets that have images or illustrations arranged in sequence. As the flipbook is explored, the images give the illusion of movement due to small changes in the position or shape of the image from one page to the next (Selvi, et al. 2016).

Learning media used in learning can certainly have advantages. Wibowo and Purnamasari (2019) state that the advantages of flipbook media are: able to present diverse material; easy manufacturing process; flipbook price is relatively cheap; display is more attractive and interesting; save device memory; increase students' mastery of abstract material, such as: build space; easy to carry everywhere. The benefits above provide opportunities for teachers to make learning easy for students to understand.

The benefits of flipbook media are explained by Sari and Ahmad (2021), namely: improving learning outcomes, this is because there are video illustrations and animations so as to build understanding of the concept of subject matter when compared to



reading alone; helping to increase activity in learning, students can enjoy diverse activities during learning; increase motivation and interest in learning, because the flipbook display in the e-book is 3-dimensional so it is interesting to read; improve creative thinking skills, because the appearance of electronic books is more attractive and there are many explanatory elements.

Mathematics is a field of study that deals with properties and relationships between abstract concepts, such as numbers, space, structure, and change. Mathematics has a critical role in various disciplines and daily life, providing tools for modeling natural phenomena, scientific research, problem solving, and decision making (Alfiyah et al., 2021). This emphasizes that mathematics is structured knowledge. This means that early math material becomes prerequisite material for the math material to be taught.

Elementary school mathematics materials can be broadly grouped into three, namely: numbers, geometry, and social arithmetic. In learning in elementary school, there needs to be stages, as described in Bruner's learning theory. The stages are: enactive stage (concrete), iconic stage (semi), and symbolic (abstract). Mathematics learning is an activity that relates to teachers and students directly with the aim of helping students construct mathematical knowledge (Suyono, 2014). The problem that exists during the teaching and learning process is that students have difficulty in understanding mathematical concepts on the volume of blocks and cubes.

Halimi, et al. (2021) explain that a spatial figure is a three-dimensional geometric object that has length, width, and height, in mathematics spatial figures are often identified by their geometric properties which include volume, surface area, and dimensional shape. The explanation above emphasizes that learning geometry requires a good imagination to be able to understand the elements of the object. Low understanding of geometry material based on research obtained data, namely: teachers often communicate the wrong concept, for example: the notion of volume with the content is considered the same; object solid objects with object models; teachers in drawing have not been able to separate between the field and not the field, sides and ribs.

Measuring the elemental part of the building, especially in the space section, the picture displayed by the teacher directs to the intersection between the line and the ribs that are in different planes. This makes students less optimally understand the picture and eventually make mistakes in making calculations. This condition was explained by a teacher at a public elementary school in the Ambal sub-district of Kebumen district, namely: 21 out of 24 students do not optimally understand the calculation of measuring one of the elements of a space due to poor imagination. So that they are less able to apply the Pythagorean calculation. 27 out of 32 teachers stated that explaining spatial shapes often directly gives the formula, for example: volume and area.

Poor imagination worsens speaking skills in math learning. Yusuf (2021) explains that math speaking skills are skills in using mathematical terms and symbols correctly and in accordance with the context. Skills in explaining in detail the steps or processes used to achieve a mathematical problem solving. On the other hand, it is emphasized that mathematics learning will be more interesting if the communication used is dialogical. Wood (2012) explains that mathematical communication skills refer to the ability of mathematics teachers to convey, articulate, and understand mathematical concepts clearly and effectively. This involves the use of mathematical language, symbols, and visual representations to communicate about mathematical ideas, problem-solving processes.

The use of this online book is able to improve speaking skills in the language of mathematics. Mathematical communication is a person's ability to convey ideas, thoughts, and solutions related to mathematical concepts clearly and effectively to the recipient of the information. It involves the use of mathematical language to convey news, provide explanations, and communicate about mathematical problems. Sudjana (2017) explains that mathematical communication includes not only verbal, but also written and symbolic skills in conveying ideas systematically.

The relevant research in this article is the research results from Rahman, et al, (2021), namely flipbook media is an e-book in the form of a digital or flipbook and is a form of electronic book that can be accessed through electronic devices such as computers, tablets, e-readers or smartphones. Unlike traditional printed books, e-books can be stored in digital format and downloaded from the internet or read directly through a special platform or application. Thus, this media is able to provide opportunities for use in different places and different times as well. The focus of this research is the utilization of flipbook media. While the research that researchers carry out focuses on the needs of flipbooks in learning mathematics with geometry material flipbook media in elementary mathematics learning with geometry material for elementary students.

The results of research from Falah, et al, (2021) explain that the results of the development and trial of flipbook media are stated to have good validation, in terms of feasibility of content, language, and appearance; and describe the practicality of e-books in terms of observations of implementation. The method used in this research is a modified research and development method. The



focus of this research is to describe the stages of validating flipbook products. While the researcher's research focuses on the need for flipbook needs in mathematics learning with geometry material for elementary school students.

The results of research from Hidayatulloh, et al, (2019) explain that the results of the study indicate that: the validity of the Electrical Circuit Flipbook is very feasible; the practicality of the Electrical Circuit Flipbook is included in the very practical category; and the effectiveness of the Electrical Circuit Flipbook is included in the very effective category. The developed Electrical Circuit Flipbook is suitable for use as learning media. The focus of this research is to apply flipbooks to students whose imagination is lacking and teachers are less skilled at describing electrical circuits. While the researcher's research focuses on the need for flipbooks in mathematics learning with geometry material for elementary school students on flipbook media.

The results of research from Lakapu, et al, (2023) explain that research using flipbooks has increased boys' interest in learning in out-of-school education, rt/rw 003/006. The method used is classroom action research method, the research subject is school-age boys, using flipbook media compared to other media. This is because flipbook media is more interesting because the material is much more interesting because it can combine text, audio, video, images, and even flash animation. The focus of this research is to apply flipbooks to students outside of school. While the researcher's research focuses on the need for flipbooks on learning math with geometry material for elementary school students.

The results of research from Afwan, et al, (2020) explain that the results of the study show that the digital media Flipbook based on 'Battle 5 Hours in Kalianda' has proven to be valid and and feasible according to the assessment of material experts and media experts, while the results of small group trials, limited trials, and broad trials show digital learning media Flipbook digital learning media based on learning media 'Battle 5 Hours in Kalianda' has proven to be effective and in accordance with the needs analysis. This research focuses on the development of flipbook media, while the research that researchers carry out focuses on the need for flipbooks in mathematics learning with geometry material for elementary school students.

Based on the description above, in this study researchers focused on the need for flipbook media for learning mathematics with geometry material for elementary school students in the Ambal district of Kebumen Regency, Central Java. Noting the description above, researchers can formulate the problem, namely: how is the need for flipbook media for learning mathematics with elementary school geometry material in the Ambal sub-district area? The purpose of this study is to describe the needs of flipbook media in learning mathematics with elementary school geometry material in Ambal sub-district.

RESEARCH METHODS

The type of research in this article is descriptive qualitative. The definition of qualitative research type is explained by Sugiyono (2019: 18), namely scientific conditions when studied (experimental), researchers act as instruments, and data is analyzed with qualitative properties that focus on emphasizing meaning. This emphasizes that during data collection, researchers are not allowed to intervene with research subjects.

The research started from July to December 2023, in public elementary schools in the Ambal sub-district of Kebumen district, Central Java. The subjects of the research were 30 teachers and 20 students of grade IV of the State Elementary School. The main source of data was mathematics learning media with geometry material in class IV elementary school. While the supporting data is the teaching module. Data collection techniques were conducted by observation, questionnaires, and in-depth interviews with informants. Primary data are the results of interviews and secondary data are teaching modules.

The data that has been collected is then tested for degrees of trustworthiness (validation). Moleong (2019: 48) explains that the technique to test the degree of trust, one of which is by triangulation. In this study, researchers used source triangulation with interview and matching techniques.

The first stage after the data is collected is analyzed. Afrizal (2015) explains that data analysis activities are processing basic data that is still in the form of actions, narrations, field notes, and written materials that support research, so that it can be interpreted. In this study, data analysis activities used interactive analysis from Miles and Huberman. The stages of analyzing data are explained by Afrizal (2015), the stages of analyzing qualitative research data are data reduction, data presentation, and drawing a conclusion. Data reduction is intended for data that does not have depth of information. Data presentation is intended for data that has a connection so that it can form an initial concept. Meanwhile, drawing conclusions is intended as an activity to connect several concepts into a theory.



RESULT AND DISCUSSION

Result

The results of research based on the questionnaire obtained data that all elementary school teachers use learning media when learning math geometry material. The learning media, namely: reference books as print media and models of building space, such as: cube model, block model, ball model, cone model, tube model. This is also reinforced by interview data, namely: teachers use the model of the building space because it is more efficient in providing media, because the media already exists at school; the media model of the building space is to help realize the position between the lines that when drawn will look like intersecting; the time to prepare and design media content requires its own time, so it is felt by the teacher as a burden to be a teacher. The interview evidence is as follows:

Subject 1: "...as usual every year...using student worksheets...brought the model of the building that will be taught...both media are more practical...and do not burden the teacher in teaching preparation..."

Subject 2: "...Learning mathematics by bringing a model of a building space tends to materialize...or concretize according to the facts...so it will be easier to give examples of mathematical calculations..because if drawn it will appear that some lines will cut each other..."

Based on the questionnaire, 26 out of 30 (86.67%) teachers stated that they did not know flipbook media because they were used to using videos from Youtube or making a summary of the material which was then written in Powerpoint. Given that they do not understand flipbook media, the teacher does not understand the facilities in the software. The facilities, namely: having animation facilities so that they can make objects in accordance with daily facts; does not require large storage space (memory), so it will not burden the teacher in storing the document. This is reinforced by the interview data, namely:

Subject 3: "...I don't know the form of the media...because the media I use is Powerpoint...I don't know the facilities available...and I am afraid that because it is in the form of images and text it will require a large storage space..."

Four teachers who were familiar with flipbook media stated that they had known the media but had never created the content. This is because the time to prepare is considered long and requires patience in designing it. The reason used by the teacher is reinforced by the interview data, namely:

Subject 4: "... seeing a demonstration of flipbook media during KKG... it can be explained that flipbook media has facilities that can realize conditions such as daily facts... the object of building space can move according to the maker... this builds a mindset in teachers that making flipbooks takes its own time..."

The results of the demonstration during the activities of the teachers' working group (KKG), Wednesday, July 26, 2023, obtained data that all teachers (30 out of 30 teachers) stated that learning using flipbooks can convey the message of learning mathematics geometry material in a concise and practical manner because it is described in detail and full of animation. This is evidenced by the teacher's statement:

Subject 5: "...very interesting...there are pictures of cubes...blocks...which are depicted very clearly...because there is animation...does not require imagination in understanding the picture...build the concept of area...volume...very easy to understand..."

The results of the questionnaire after the demonstration of mathematics learning using flipbook media, obtained data that 28 out of 30 (93.33%) teachers stated that flipbook media has facilities that are able to make images like life, easy to make, does not require a large storage area, and provides convenience to be seen and studied at any time. Thus, teachers need flipbook media to be taught and then will be used as a medium for learning mathematics. This is reinforced by the results of the interview, as follows:

Subject 6: "... flipbook media is easy to make... does not require a large storage area... the picture feels alive... easy to learn at any time..."

The results of interviews with students obtained data that all students (20 out of 20 students) obtained data that flipbook media in the form of hardware can be brought to study and discuss with their friends in class or in the school yard. While those who have cellphones (HP), learners can reopen at home and can discuss with their siblings or parents, if they find material that has not been understood. This is evidenced by the learners' statements, as follows:

Subject 7: "...yesterday I saw the flipbook with my friends in the school canteen...I like it...because I can learn with my friends and I don't have to learn in my head...I hope...if the flipbook is in IPAS, Bahasa Indonesia...yes, I definitely like it because it is interesting..."



Subject 8: "...if I open the flipbook with my cellphone at home...I study it with my brother...I'm happy...because I can ask questions if I don't understand...but I see...I can understand...very good..."

The observation results obtained data that students are very enthusiastic about using flipbooks because they can be used in the classroom, or when the teacher is absent, and when outside the classroom. Learners show seriousness in reading and understanding geometry material and there is mutual dialog between learners. There are learners who ask questions when opening and understanding the flipbook, then there are those who give answers and comment to emphasize the answers asked.

Discussion

Utilizing learning media using computer software is needed by teachers to concretize mathematics learning with geometry material. This is because, building space requires a good imagination in order to understand its constituent elements and can be used at any time. This is in accordance with the research of Rahman, et al, (2021), namely flipbook media is a digital e-book or flipbook and is a form of electronic book that can be accessed through electronic devices such as computers, tablets, e-readers or smartphones; which is easy to access.

Flipbook media is very helpful for explaining certain parts of the object of building space. This is because flipbook media has facilities that make it easy to help students in imagining about building space. Thus, teachers are easy to teach and students can learn gradually in using their imagination. This is because, flipbook media has facility features that can be understood in detail and generate motivation to continue reading. This is in accordance with the research of Lakapu, et al. (2023) that flipbook media is more interesting because the material is much more interesting because it can combine text, audio, video, images, and even flash animation.

Flipbook media is able to generate teacher motivation to teach more easily in learning mathematics with geometry material. So that this teacher motivation becomes the basis for planning and implementing good math learning. If learning is able to provide a good space then it can lift the achievement of students. This is supported by data from Hidayatulloh, et al, (2019) that flipbook media has provided convenience in learning electrical circuits.

Teachers and students have understood the benefits of flipbooks that are planned to be developed to become learning media in elementary schools. The benefits that can be described are: can convey the message of learning mathematics with geometry material concisely and practically. This is because students do not need the imagination of space because it has been explained through animated motion pictures. This is supported by Danoebroto (2016) who states that mathematics teachers need to have knowledge of the potential of local culture related to mathematics, understand the mathematical knowledge obtained by students from their daily activities and have the skills to design and develop mathematics learning using culture.

The flipbook media shown during the demonstration can be used by students in learning in the classroom and outside the classroom. this is because flipbook media can be carried anywhere by students. In addition to this, flipbook media can also increase the enthusiasm of students to learn in groups and individually. It is proven, flipbook media is able to discuss with other people, such as: parents of students, siblings of students, and can be used anywhere and anytime. Sumiyati, et al, (2018) which states that mathematics learning media need to pay attention to the development of the way students learn today and the learning facilities they have. This statement suggests that flipbook media needs to be developed because it is easy to use to build mathematical concepts, not tied to one place because it can be used anywhere and anytime.

CONCLUSION

The need for flipbook media in learning mathematics with elementary school geometry material in the Ambal sub-district, Kebumen district, Central Java, is concluded to be needed. This is because: flipbook media has facilities that easily generate motivation to learn; making flipbook content is easy and does not require large storage space; and can be studied at any time according to the situation, both in the classroom and outside the classroom; and is able to build dialogic communication between students and students, students and teachers, and students and others (such as: parents of students and their siblings).

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