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Analysis of the Needs of Mathematical Comics to Improve Students' Numeracy Literacy Skills in Cartesian Coordinate Material

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ABSTRACT
The purpose of this study was to analyze the need for mathematical comics to improve students' numeracy literacy on coordinate cartesian material. The sampling technique used by researchers in this study is a purposive technique which is a sampling technique with certain considerations. The data collection instrument used in this study was using a preliminary study questionnaire. The preliminary study questionnaire used aims to determine students' needs for mathematics comics and determine the level of student numeracy literacy. Based on the results of the research above, it is known that there are still many students who do not like mathematics and have difficulty in understanding the mathematical material provided. The learning media used also cannot make students like mathematics. On the other hand, students are very interested in the idea of using math comics in mathematics learning. Moreover, researchers assess that students' numeracy literacy skills still need to be improved. Therefore, mathematics comics to improve students' numeracy literacy skills are needed.

***Keywords**: Math Comics, Needs Analysis, Student Numeracy Literacy*

INTRODUCTION
Mathematics is one of the strategic fields in developing students' potential to understand and apply mathematical concepts in everyday life (Ariyana &; Suastika, 2022; Sayekti, 2020). Mathematics focuses on teaching mathematical concepts to individuals (Hartono &; Karnasih, 2017). The main goal of mathematics is to develop students' understanding, skills, and logical thinking towards mathematical structures and patterns (Rosita, 2014). To achieve this goal, it takes a liking from students in learning mathematics to make it easier for students to understand the mathematical material provided (Sholehah et al., 2018). However, based on the results of preliminary study questionnaires that have been conducted, there are 70% of students who do not like mathematics. Furthermore, there are 21% of students who think that mathematics material is difficult. In fact, through mathematics, students are expected to be able to apply mathematical concepts in everyday life and in various contexts (Suryapuspitarini et al., 2018). Therefore, one of the abilities that can help students apply mathematical concepts in everyday life is numeracy literacy skills (Pulungan, 2022).

Numeracy literacy is a person's ability to understand, use, and interpret numerical information in various contexts of daily life (Mahmud &; Pratiwi, 2019; Siregar, 2022). This ability is not only about basic math skills, but also involves understanding mathematical concepts in a real-world context (Sidiq et al., 2023). The importance of numeracy literacy lies in its ability to empower individuals in facing mathematical challenges in everyday life, in the workplace, and in active participation in society (Masri et al., 2023). Numeracy literacy is not only an academic skill, but also a powerful tool for decision-making and problem-solving in

various aspects of life (Muslimah, 2023). However, based on several previous studies, students' numeracy literacy is often still low (Ambarwati &; Kurniasih, 2021; Silitonga et al., 2022; Yustinaningrum, 2021). A number of studies have also highlighted the importance of creative and visual approaches in mathematics teaching to improve students' numeracy literacy (NCTM, 2000; Tzekaki et al., 2008).

One creative and visual approach to improve students' numeracy literacy is to utilize math comics. Comics are a visual art form that combines images and text to tell stories or convey information (Prayoga, 2021). Usually, comics consist of sequential panels that arrange narrative or humor in a visual and narrative way (Nirvana, 2020). Comics have visual and narrative appeal that can make mathematical material more interesting and easier to understand (Wahyuni &; Umar, 2016). This is also supported by the results of a preliminary study where there are 34% of students who feel that learning using math comics is very interesting and 66% of students who feel that learning using math comics is interesting.

One of the essential topics in mathematics learning that can be used in mathematics comics is cartesian coordinate material, where students must be able to understand the basic concepts of using the x-axis and y-axis to determine the location of a point in space (Hardiana, 2022). Learning cartesian coordinate material also helps in the development of a number of cognitive and problem-solving skills that are useful in a variety of contexts (Annisa, 2023). However, there are still many students who think that cartesian coordinate material is difficult. Therefore, mathematical comics are needed to help students understand cartesian coordinate material. The use of comics as a tool in learning mathematics has shown success in increasing students' interest and understanding of certain materials (Akbar &; Cahyono, 2017). The use of mathematics comics in particular can also help students improve students' numeracy literacy skills (Kustantina et al., 2022). However, research that specifically analyzes students' needs related to the use of mathematical comics on cartesian coordinate material is still limited.

Therefore, this study aims to conduct a needs analysis related to the use of mathematical comics in cartesian coordinate material as an effort to improve students' numeracy literacy. By identifying these needs, it is hoped that mathematical comics can be developed in accordance with the characteristics and needs of students, so that they can be an effective learning medium and support the improvement of numeracy literacy.

METHOD

The type of research conducted is qualitative descriptive research. This research focuses on selecting information that will be used as a source of data collected, assessed, and then drawn a conclusion from the information obtained. The purpose of this study was to analyze the need for mathematical comics to improve students' numeracy literacy on cartesian coordinate material. The sampling technique used by researchers in this study is a purposive technique which is a sampling technique with certain considerations. The data collection instrument used in this study was using a preliminary study questionnaire. The preliminary study questionnaire used aims to determine students' needs for mathematics comics and determine the level of student numeracy literacy.

RESULT AND DISCUSSION

Result

The results of this study are an explanation of the analytical activities carried out by researchers which include needs analysis, curriculum analysis, material analysis, and student analysis. Here's a look at each of these analyses:

- Needs Analysis

  Needs analysis is carried out by analyzing the learning media used in the learning process of students at school. At this stage, it will be determined what learning media will be used by students in learning. From the results of the preliminary study questionnaire, it is

known that 66% of students learn only through books, 32% through LKPD, and the rest through others such as learning videos. From a preliminary study questionnaire, researchers found that 89% of students were interested if math material was integrated into math comics. Therefore, it can be concluded that students feel interested in mathematics comics as a learning medium to be used.

- Curriculum Analysis

  Curriculum analysis is carried out by taking into account the characteristics of the curriculum that is currently underway and that is being used in accordance with the curriculum implemented in schools. From the results of interviews conducted by researchers, the school still uses the 2013 curriculum. In practice, teachers make Learning Planning Plans (RPP) by adjusting Core Competencies (IC), Basic Competencies (KD), and Competency Achievement Indicators (GPA) that have been adjusted to the 2013 curriculum.
- Material Analysis

  Material analysis is carried out to determine and compile material that will be used systematically to suit learning objectives. The material will be integrated into math comics. The selection of material is carried out by considering the Basic Competence (KD) and Competency Achievement Indicators (GPA) and then designing and compiling teaching materials systematically.
- Student Analysis

  Student analysis was conducted to determine student characteristics and student numeracy literacy skills. Based on the results of the preliminary study questionnaire, there are 70% of students who do not like mathematics. Furthermore, there are 21% of students who think that mathematics material is difficult. In addition, there were 28% of students who felt that their numeracy literacy skills were low, 55% of students who felt that their numeracy literacy skills were moderate, and 17% of students who felt that their numeracy literacy skills were high.

Discussion

From the results of the analysis that has been done, it can be seen that many students do not like mathematics. It is evident from the results of a preliminary study questionnaire that shows that there are 70% of students who do not like mathematics. This is also supported by 21% of students who have difficulty in understanding the mathematics material given by the teacher. Based on these results, a learning medium is needed that can increase liking and that makes it easier for students to learn mathematics because with this liking can help students improve student numeracy literacy. Looking at the learning media that have been used by students, based on the preliminary study questionnaire, it can be seen that 66% of students learn only through books, 32% through LKPD, and the rest through others such as learning videos. This shows that there is no learning media that can make students like mathematics. This further strengthens students' need for math comics to improve students' numeracy literacy skills.

The need for math comics is supported by 49% of students who have never learned mathematics using math comics. The results of the preliminary study questionnaire also showed that 89% of students found it very interesting if learning mathematics using math comics. With high interest from students, researchers concluded that mathematics comics are needed by students to be applied in mathematics learning.

Numeracy literacy skills are also a special concern because there are 17% of students who feel that their numeracy literacy skills are low. In addition, there are also 55% of students who feel that their numeracy literacy skills are moderate and there are 28% of students who feel that their numeracy literacy skills are high. Therefore, researchers concluded that mathematics comics are needed by students to improve students' numeracy literacy skills. Based on previous research, the use of comics as a tool in learning mathematics has shown success in increasing students' interest and understanding of certain materials (Akbar &; Cahyono, 2017). The use of

mathematics comics in particular can also help students improve students' numeracy literacy skills (Kustantina et al., 2022). However, research that specifically analyzes students' needs related to the use of mathematical comics on cartesian coordinate material is still limited.

CONCLUSION

Based on the results of the research above, it is known that there are still many students who do not like mathematics and have difficulty in understanding the mathematical material provided. The learning media used also cannot make students like mathematics. On the other hand, students are very interested in the idea of using math comics in mathematics learning. Moreover, researchers assess that students' numeracy literacy skills still need to be improved. Therefore, math comics to improve students' numeracy literacy skills are needed. Suggestions for future research are to apply math comics to improve students' numeracy literacy and review students' responses to applied math comics.

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