DPJPM
Delta-Phi: Jurnal Pendidikan Matematika
https://www.journal.assyfa.com/dpjpm

Delta-Phi: Jurnal Pendidikan Matematika, vol. 1, pp. 15–19, 2023
Received 20 Feb 2023/published 30 Apr 2023
https://doi.org/10.61650/dpjpm.v1i1.36

Analysis of The Relationship Between Student Interest and Written Communication in Solving Realistic Mathematics Problems

Diella Aprilani Luthfia Amany[1], Annisa Amallinda Indriatno Puteri[2], and Samuel Karim[3]

1. *Universitas Muhammadiyah Malang, East Java, Indonesia*
2. *Universitas Muhammadiyah Malang, East Java, Indonesia*
3. *Ernest Bai Koroma University of Science and Technology and College of Human Resources Development Sierra Leone, Afrika*

E-mail correspondence to: diellaamany@gmail.com

Abstract

The world of human education can be studied structured and well-supported. Because learning to build each person's personality. Interest is the tendency to observe and remember various activities. Always pay attention, followed by fun, interest, desire, concentration, and student's understanding of mathematics. Communication can be interpreted as conveying messages from a messenger to a recipient intending to express or inform a comment orally or in writing. This study aimed to determine the relationship between interest and students' written communication skills in solving realistic mathematical problems. This research is a qualitative descriptive study. Data was obtained by using questionnaires and tests. The subjects of this research were two students of class XI MIPA. The steps taken are learning through the WhatsApp group by individually working on questionnaires and tests. The researcher identified and analysed the answers to each indicator of interest and ability to write mathematical communications for each statement and question. The method of data analysis in this paper was tried through 3 stages: data reduction, data presentation and conclusion. The paper results show that the relationship between interest and written communication skills in solving realistic math problems is directly proportional, where student 1's interest is still low, and his ability is still classified as poor. Student 2 has a moderate interest, and his abilities are directly proportional, namely, not too sour or too good.

Keywords: Mathematical Realistic Problems, Problem-solving, Student interest, Writing Communication Skills.

Introduction

The world of human education can learn in a structured and well-facilitated manner because learning with everyone's personality will be built (Belser et al., 2018; Draijer et al., 2022; ten Hagen et al., 2022). Mathematics is fundamental in many fields because mathematics is likened to an object that is very important in the development of science and technology (Belser et al., 2018; Pertiwi et al., 2020; Solari et al., 2022). Interest is a tendency to keep observing and remembering various activities, such as being watched continuously by a feeling of happiness, concern, desire, concentration, and students ' understanding of mathematics (Gunawan et al., 2022; Zur et al., 2022). in other words, students will show interest in learning mathematics when they can communicate their wishes to others. In addition, students must also be able to show their wishes to others by conveying that these students are interested in (Mikhailova et al., 2022) and understand learning mathematics (Sarifah et al., 2022), either through attitude or language (Leyva et al., 2022). Therefore, the importance of communication skills in learning mathematics is necessary as a form of treatment shown by students in their interest in learning mathematics.

Communication can be interpreted as a technique for expressing a message from the messenger to the recipient to express or notify comments either orally or in writing (Leyva et al., 2022; Utomo, 2019). Students' success in improving their mathematical communication skills can affect several aspects, both from their own and external factors (Armania et al., 2018; Luo et al., 2022; Partono et al., 2021). One of the aspects of a person that can influence learning outcomes is interest in learning (Gray et al., 2020; Lería et al., 2022; Rudianto et al., 2022). The teaching and learning process of some students can be classified as having high learning interest, moderate and not a few students whose learning interest is relatively low, especially in mathematics (Pelaccia & Viau, 2017; Rajprasit et al., 2022; Wang & Pan, 2022). Student learning outcomes will be maximised when students are highly interested in mathematics. Meanwhile, to show interest, students must have good mathematical abilities.

Given the importance of mathematical communication, it is necessary to have a learning approach that adds to mathematical communication skills and interest in learning (Canedo et al., 2020; Kamid et al., 2020; Trung et al., 2020). The approach used is Realistic Mathematics Education because this learning approach emphasises interaction between students, students with teachers and students with educational features (Rahmah et al., 2022; Sugianto et al., 2017). Realistic mathematics describes the knowledge of mathematics as the subject, how students learn mathematics and how it should be taught (Darmayanti, 2023; Palinussa et al., 2021; Sitorus & Masrayati, 2016). Mathematical realistic learning has a reality opinion that is not consistently expanded during the last part of the learning process, but only resources for teaching and learning mathematics (Bray & Tangney, 2016; Inganah et al., 2023a). Mathematics has five realistic characteristics: 1). Utilizing contextual problems (Syaifuddin et al., 2022), 2). Using a variety of ways (Darmayanti, Sugianto, et al., 2022; Hasanah, Syaifuddin, et al., 2022), 3). Student participation (AN Vidyastuti et al., 2018; Kuo & Hsu, 2020), 4). Student activeness (Ng et al., 2020), and 5). Harmony (Anjarwati et al., 2023; MM Effendi et al., 2022; Qomariyah et al., 2023). This knowledge is described as a realistic characteristic of mathematics, where realistic design is the knowledge background of students who are known in their activities, then it will become a factor in designing ideas that link various backgrounds and mathematical ideas (Kutluca & Gündüz, 2022; Sugianto, Darmayanti, et al., 2022). A person's success in improving mathematical communication skills can be influenced by several aspects, both from within and outside the person concerned. One of the aspects of a person that might influence learning outcomes is interest in learning (Gee et al., 2018).

Curriculum integration, a merger between mathematics and religion, has been designed but not realised in the field (Dagley et al., 2016; Plasman & Gottfried, 2020). Today, there is still a strong perception in society that religion and science are two separate and irreconcilable entities. As for the status of each theory (Safitri et al., 2023; Sugianto et al., 2023) has its entity, even down to the organising body. In other words, science does not care about religion, and religion does not care about science (Ma'zumi et al., 2020). his is an overview of educational practices and scientific activities in this country today (Inganah et al., 2023b; Mustakim et al., 2023), which have had various adverse impacts and are recognised by the wider community (Belser et al., 2018). Therefore, this erroneous assumption must be corrected. One of the impacts that can be caused is in determining a career.

Several obstacles were found based on observations and unstructured interviews conducted by researchers during mathematics learning in class XI SMA with mathematics teachers and students. Students do not like learning mathematics. They are interested in learning, pay attention while learning and are involved. In addition, when facing math problems, students must be able to express opinions and ideas adequately, complete information, communicate, inform, direct, motivate, and invite, or communicate in various languages. This shows that students' mathematical communication skills and learning interests are still not optimal. From this background, the researcher is interested in how students' communication skills and interest in mathematics are affected. This study aimed to determine the relationship between students' interest in solving realistic mathematical problems and their ability to communicate in writing.

Research Methode

This study uses descriptive qualitative to reveal the relationship between aspects and various variables that affect conditions without manipulating these variables (Hasanah, In'am, et al., 2022). Figure 1 is the flow of this research.

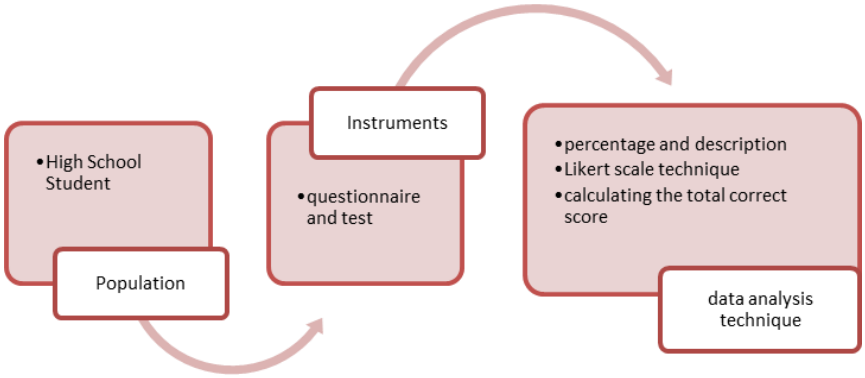

Figure 1. Method flow in analysing the relationship between interest and communication

In Figure 1, it can be seen that the population in the study here were students of class XI Science, and the sample in this study were students of class XI Science who were taken randomly around the house, namely at Perum—a variety of Consensus 2 Kalianda. The researcher explored the relationship between high student interest and students' written communication skills in solving realistic mathematical problems. The instruments used in this study were a questionnaire to determine students' interests and a test to determine students' written communication on realistic mathematical problem-solving (Kihwele & Mkomwa, 2022).

Furthermore, the data obtained from the questionnaire were analysed by percentage (Ababil & Septianawati, 2021) and then described in the form of student interest criteria (Pangadongan et al., 2022). Analyse the level of interest in each questionnaire statement (Humaidi et al., 2022) by calculating the percentage of statements on the appearance of high and low interest in each statement using the Likert scale technique (Vidyastuti et al., 2022). The data obtained through the problem-solving type test for realistic math questions were analysed by calculating the total correct score of the questions the respondent had worked on (Asgafi et al., 2023; Triono et al., 2023).

Results and Discussion

The data obtained is two, with two students on each instrument. Test instruments and questionnaires were given to two different people. Two students are working on test questions and two other students are working on questionnaires. The results of the questionnaire obtained from two students were taken randomly and associated with indicators/factors in assessing student interest, namely:

Table 2. Questionnaire Results from Each Respondent

No.	Indicator	Statement	Information
[1]	The amount of time used in student learning activities, namely how much time students use to study	3, 12 (positive statement)	Student 1 in statements 3 and 12 in this indicator chose to strongly disagree and agree while student 2 chose to disagree and agree.
[2]	The number of learning activities, namely how much material is studied for the time available.	8 (positive statement)	student 1 and respondent 2 in statement 8 on this indicator choose not to agree.
[3]	Tolerance in learning, namely acceptance in studying the material	10, 11 (negative statement)	Student 1 in statements 10 and 11 in this indicator chooses to strongly agree and agree while student 2 chooses to disagree and disagree
[4]	Tenacity, namely not giving up in solving a problem in learning	1, 9, 19(positive statement)	Student 1 in statements 1 and 9 in this indicator chooses to disagree and in statement 19 chooses to strongly disagree while student 2 chooses to disagree and agree.
[5]	The capacity to master problems and complexities, namely the ability of students to solve problems and their complexities	2, 4, 6 (positive statement)	Student 1 in statements 2 and 4 in this indicator chose strongly disagree and in statement 6 chose not to agree while student 2 chose statements 2 and 4 chose to agree, in statement 6 did not agree.
[6]	Obedience and loyalty, namely the accuracy or accuracy of students in solving a problem	17, 20 (positive statement)	Student 1 in statements 17 and 20 in this indicator chose to agree and strongly disagree while student 2 chose to agree and disagree.
[7]	How is the attitude in learning, which is seen from the attitude of students when learning	5,14,18 (positive statement)	Student 1 in statements 5 and 14 in this indicator chose to strongly disagree and in statement 18 chose to strongly agree while student 2 in the three statements chose to agree.
[8]	Take all learning activities seriously	13,15,16 (positive statements)	Student 1 in statements 13 and 15 in this indicator chooses to disagree and in statement 16 chooses to agree while student 2 in statements 13 and 16 chooses to agree and in statement 15 chooses to disagree.

The data obtained are as many as two answers from each student. The test results were obtained based on applying the characteristics of written communication skills in solving mathematical realistic problems. Table 2 shows the number of scores obtained by each student for each test item.

Table 2. Results of each respondent's test scores

Respondents	Question Number				Final score
	Problem 1	Problem 2	Problem 3	Problem 4	
1	5	5	5	25	40
2	25	5	5	25	60

From Table 2, it can be seen that there are differences in the final value results obtained. Based on the results of the answers to each test item, the written communication skills of each student were analysed with their respective answers. The results of the test scores obtained show the level of students' mathematical written communication abilities according to the specified indicators.

Tables 1 and 2 show the results of filling out questionnaires and tests from the two respondents. In the results obtained, there are differences in the levels of interest and abilities between each student. Student 1 in the questionnaire results, which has been associated with indicators of student interest, includes having a low interest in solving realistic problems. In contrast, student 2 has a moderate interest in this. Students' interest in solving realistic mathematical problems is very influential in student learning outcomes because it will encourage students to continue to try to find solutions to the problem (Han & Yin, 2016).

The second result is that the tests of these two students also have differences, although not too far from the results of the acquisition of scores. Table 2 shows the results of each student's test scores, where student 1 got a lower score than student 2. Students working on some of the questions could find out what the questions wanted the main idea that became the problem, and compile the solution. However, in some questions, students could not complete the test according to the indicators.

Based on the results of this analysis, it can be concluded that interest in learning is an essential aspect of learning mathematics. Students can experience changes in interest because many external and internal factors drive them. The first factor is internal factors influencing learning success, such as student characteristics, health, intelligence and talent, interest and motivation, and student study

habits. The second factor is external factors, or factors that can influence learning success: teacher, school, and learning environment factors. The creativity of a teacher's teaching can affect student learning interests. High curiosity increases students' interest in learning material. An earlier study by Darmayanti et al. (2022) and Lazarides et al. (2022) found that not all high school students are interested in learning mathematics. A previous study by Wulandari et al. (2022) also found that students' lack of interest in learning mathematics and low student learning outcomes were the leading causes of students' learning difficulties. Previous research by Rizki et al. (2022) found that students showed little interest in mathematics because most math classes were abstract and challenging to understand. Sugianto et al. (2022) found mathematics to be a less attractive subject for students. One of the reasons for this situation is that math learns many abstract things: geometry, equations of lines, and algebra. Mathematics becomes more complex and challenging for students. Students then think mathematics is complex and challenging because it is complicated to understand. While it is true that all students have the opportunity to perform satisfactorily in school, the reality is that students differ substantially in intellectual and physical abilities, family backgrounds, habits, and learning methods, so it may be difficult for students to absorb the material presented in the captured class (ND Safitri et al., 2023; Sekaryanti et al., 2023). This has been found to impact the achievement of learning objectives significantly.

In addition, students' communication skills regarding the teaching and learning process are also one of the essential learning materials. Communication in learning mathematics plays a vital role that every student must own. Communication allows students to exchange ideas with other students and teachers. Even now, there are still many students who are hesitant to ask their teacher about things they do not understand. Even when the teacher asks questions, they are not good at explaining them orally. In addition, it is difficult to explain my understanding in sentences, and I am embarrassed to explain my thoughts verbally in front of my friends.

This was also reported by (Fauza et al., 2022; Sah et al., 2023) stated that because classroom learning, especially mathematics learning, tends to be led by the teacher, students still act as passive learners. In addition, many students are still hesitant to ask their teachers about complex subjects, and their mathematics learning outcomes are low. Darmayanti et al. (2022) also stated that teachers do not allow variations in the learning process. Most teachers use the lecture method in teaching and learning, so students get bored quickly. During the teaching and learning process, teachers tend to ask practice questions and provide material too quickly, making it difficult for students to follow the teaching and learning process. The results of this study also show that the relationship between interest and written communication skills is directly proportional to the completion of real-world math problems, even though student 1's interest and ability are still low. Student 2's interest is moderate, and his ability is directly proportional, not wrong or bad. Teachers must be able to make learning mathematics fun by creating a learning environment where students can learn mathematics.

Conclusion

The relationship between interest and students' written communication skills in solving mathematical realistic problems in the inverse matrix material is the relationship between students' interest and ability levels. Solving problems individually is still unreasonable and inconsistent in each test item. The relationship between each student's interest and ability is still directly proportional, where student 1's interest is still low, and his ability is still classified as not good. Student 2 has a moderate interest, and his abilities are also directly proportional, neither bad nor good.

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