The Analysis of PISA Mathematical Literacy in Terms of Student Learning Style Assisted By Google Classroom

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Abstrak

This study aims to describe students' PISA mathematical literacy skills based on algebraic competence in terms of learning styles students of class VII-C a State Junior High School in Jepara. The type of research used is descriptive research with a qualitative approach. The instrument used was a student learning style questionnaire and a PISA math literacy test and an interview guide. The data analysis technique used is the data analysis technique developed by Miles and Huberman. The results showed that visual learning styles have very good PISA mathematical literacy skills, auditory learning styles have good PISA mathematical literacy skills, and kinesthetic learning styles have poor PISA mathematical literacy skills. And to improve students 'PISA mathematical literacy skills, teachers need to get used to giving PISA math literacy exercises to students so that students' literacy skills can be better and student learning styles at levels 5 and 6 can be achieved.

Keywords: Literacy, PISA, Learning Styles.

Introduction

Education is a human need throughout life and plays an important role for the development and progress of a nation. 21st century education requires everyone to develop all of their competencies (Edimuslim, Edriati, & Mardiyah, 2019).

Program for International Student Assessment (PISA) is an international standardized assessment to measure the learning ability of school students at the age of 15 through a series of tests from countries that are members of the OECD. According to data obtained from the OECD from the 2000-2018 survey period, Indonesia consistently ranks in the bottom 10. As shown in Table 1.1

Table 1.1 PISA Score and OECD PISA Ranking of Indonesian Students

Year	Score	International Score	Ranking	Participant
2000	367	500	39	41
2003	360	500	38	40
2006	391	500	50	57
2009	371	500	61	65
2012	375	500	65	66
2015	386	500	62	70
2018	379	500	75	80

This shows that the literacy ability of Indonesian students is still relatively low and the first factor that causes low grades of Indonesian students is the lack of training of Indonesian students to solve PISA problems (Wardhani & Rumiyati, 2011; Wardono & Mariani, 2017), so that students find it difficult to reason, argue and think creatively in solving problems (Wardhani & Rumiyati, 2011).

Another factor that causes the low grades of Indonesian students is learning styles (Breen, Cleary, & Shea, 2009). Everyone has their own learning style and cannot be forced to use a uniform learning style (Edriati, Hamdunah, & Astuti, 2016). Information about learning styles can help teachers find out how students can best understand, identify, and discover what they have learned (Currie and Ozgen, 2013). This is because the level of students' ability to understand and absorb learning materials is different.

Research Objectives (Purpose of Study)

This study aims to describe PISA's mathematical literacy skills based on PISA's mathematical literacy competence in terms of learning styles, but is limited by aspects of content change and relationships.

Significance of the research

Based on the results of research that has been carried out by previous researchers, further research is carried out on PISA mathematical literacy abilities in terms of student learning styles assisted by LMS google classroom. The results of this study are important as a starting material for further mathematics learning research.

Research Question

How is the description of PISA mathematical literacy in terms of student learning styles assisted by Google Classroom?

Literature Review

Some research results show that there are differences in the mathematical literacy abilities of students with different learning styles in solving problems such as literacy questions (Sari, Adam, Kodirun, & Busnawir, 2019; Ricardo, et. al, 2014). Other research results state that the mathematical literacy ability of students with Auditorial learning style is at level 4. Students with Visual learning style are at level 3 and students with Kinesthetic learning style are at level (Syawahid and Putrawangsa, 2017). So it can be concluded that learning style is one of the contributing factors to student learning outcomes, especially related to cognitive modalities (Akinyode & Khan, 2016) and absorption, and regulation of information received by students in learning (Amin & Suardiman, 2016).

The importance of learning styles is something that must be owned by teachers as an effective way to provide easy and meaningful lessons. According to Jacoben, et. al., (2009) the concept of learning styles has three important implications for teachers. First, a concept that reminds us that there is a need to diversify because no learning approach will be liked by all students. Second, realizing that learning styles can increase our sensitivity to differences that exist within students themselves. Third, the concept that suggests that teachers should encourage students to think about their learning patterns so that students can develop their metacognition well. Minister of Education and Culture Regulation number 22 of 2016 concerning the structure of the primary and secondary education process says that the principles of learning used by teachers must be able to utilize information and communication technology to improve the efficiency and effectiveness of learning. Technology can be used as a learning medium with a concept that is then known as e-learning. E-learning is made in digital form with the aim of making it accessible to the wider community (Wardoyo, 2016). In addition, e-learning media is a fun medium because the concept of learning is student-centered with activities such as observing, doing, demonstrating and others that can increase student learning motivation.

This e-learning learning is growing rapidly, starting from just a power point in class to now becoming an LMS system (Learning Management System). LMS is a software application or web-based technology that is used to plan, implement, and assess a particular learning process (Sicat, 2015). One of the LMS learning media that can be used is Google Classroom. Based on the research of Sabran and Sabara (2020), the implementation of Google Classroom is quite effective as a learning plan by 77.57%, designing and making materials by 75.14%, delivery or learning delivery methods by 75%, learning interactions by 66.10%, evaluation of learning implementation is 69.01%, learning media is 77.27%.

Methods

This research is a descriptive study with a qualitative approach that aims to determine the mathematical literacy ability of PISA in terms of students' learning styles.

The research was carried out at a State Junior High School in Jepara, the material taken was a linear equation of one variable, the research subjects were students of class VII-C who were grouped based on the visual, auditory, and kinesthetic learning styles, where each group selected two students to analyze their PISA math literacy skills.

The implementation of the teaching and learning process is carried out online using the help of the Google Classroom application and the WhatsApp group. The source of the data in this study is the result of the PISA mathematical literacy ability test, the material used in the test is a matter of applying a one-variable linear equation consisting of 4 questions. In addition, students will also be given a learning style questionnaire consisting of 30 questions compiled in a google form and distributed through google classroom.

Data collection techniques in this study were carried out by giving test questions, learning learning style questionnaires, and interviews. The test technique was used to determine the PISA mathematical literacy ability of class VII in linear equations with one variable. Questionnaires are used to determine student learning styles in online learning with the help of Google Classroom and WhatsApp groups. While the data from the interviews were used to describe the PISA mathematical literacy skills of students.

The data analysis technique used in this study is a data analysis technique developed by Miles and Huberman. Data analysis activities carried out in this data analysis technique (Sukestiyarno, 2020) are data reduction, data presentation, and drawing conclusions.

Results and Discussion

Grouping students based on learning styles is done before the implementation of learning. Student learning styles are grouped into three categories, namelyvisual, auditory, and kinesthetic. Based on the results of the analysis, the grouping data is obtained as in Table 2 below.

Table 2. Grouping students based on learning styles

Category Learning Style	Students
Visual	15
Auditory	10
Kinesthetic	7
Amount	32

Analysis of PISA mathematical literacy skills based on visual learning style categories represented by DN and FM, auditory learning styles categories represented by RA and SG, and kinesthetic learning styles categories represented by TV and IL. The following is a graph of student inventory scores of each PISA mathematical literacy ability with the help of google classroom in graph 1.

Graph 1. Subject Grouping
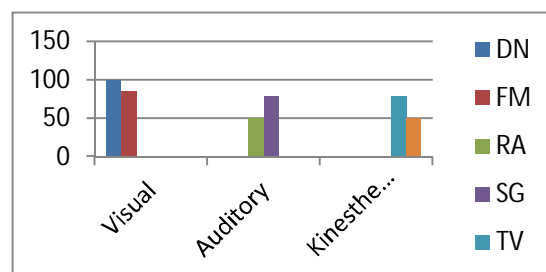
Based on the graph above, the analysis was carried out by describing the group by looking at PISA's mathematical literacy ability in terms of students' learning styles. The results of the analysis

show that subjects with kinesthetic learning styles have PISA mathematical literacy skills such as the communication component, using mathematical tools have weaknesses but the mathematising, representation, reasoning and argument components are quite good, the subject is able to reason and give logical reasons.The strategy used by the kinesthetic group subject is not appropriate so that the problems given are not resolved properly. Lack of habit of interpreting well is a problem experienced by the subject. The strategy in solving the problem is very short and simple so that the results obtained are not optimal.

Furthemore, the analysis of subjects with auditory learning style have PISA mathematical literacy skills such as the communication, mathematising and representation components are quite good but have deficiencies in the representation component, using mathematical tools and reasoning and argument. The subject does not understand the problem well so that the solution given is not optimal. Subjects are not accustomed to understanding the concepts given and giving reasons about the context of the mathematical problems presented. The analysis of the subject of the auditory group in solving problems is quite good and in sequence so that it can be easily understood. The strategy used is quite appropriate, so that the results are obtained in accordance with the context of the problem.

Finally, the analysis subjects with visual learning styles have mathematical literacy skills such as communication components, mathematising, mathematising representation, using mathematical tools, reasoning and argument, using symbolic, formal and technical language and operations, and strategic devising for solving problems very well. Broadly speaking, the visual group subjects were capable of 7 components of PISA mathematical literacy. Subjects can complete what has been planned, write down what is known and asked in the test. The subject analyzes the problem properly and sequentially so that it is easy to understand and provides conclusions in logical language. The strategy used to solve the problem is very precise so that it gets results that are in accordance with the context presented. The subject understands the problem, interprets and manipulates it very well.

Conclusion

Based on the analysis and discussion, it can be concluded that the kinesthetic learning style has poor PISA mathematical literacy skills, the auditory learning style has quite good PISA mathematical literacy skills, and the visual learning style has very good PISA mathematical literacy skills.

Suggestion

To improve students' ability in PISA mathematical literacy, teachers need to get used to giving PISA mathematical literacy exercises to students so that students' literacy skills can be better and students' learning styles at levels 5 and 6 can be achieved.

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