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Analysis of student activeness in mathematics learning with Merdeka Curriculum

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***Abstract*:** The curriculum in Indonesia has gone through various changes which are expected to make education in Indonesia grow and educate the nation's children. Government developing a Merdeka Curriculum. The Merdeka Curriculum gives students the freedom to seek scientific information so that it fosters activeness in students in learning. The purpose of this research is to know and describe the steps to overcome students when learning mathematics. This Type of research is qualitative research using descriptive methods. This research was conducted at senior high school in Surakarta with the research subjects being students of class E4 at senior high school in Surakarta and having the research objective of knowing and describing things that make students active and inactive which make students during Mathematics Learning. Furthermore, the method of collecting data in this study is observation, interviews, and giving appointments to students. Analysis conducted by researchers namely data collection, analysis of data obtained, drawing conclusions. The results of this study are the activeness of students supported by the division of small groups to build student activity in the classroom. The enthusiasm of educators can build student activity such as giving games before learning takes place. Educators also deliver material in an interesting way to make students active to learn in the classroom.

Keywords: Learning mathematics; Merdeka curriculum; Student activity

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INTRODUCTION

Along with existing developments the curriculum is growing too. The origin of curriculum is foreign language. That is Greek. Curriculum originated from the word courier which means runner and curare which means the place gallop. According to Bruner (2009), curriculum is a draft to launch the learning process with those who hold not quite enough answers in school. According to Tyler (2013), curriculum is an arrangement plan to learning process. That is arranged in a manner regular to complete a level program certain and get proof of graduation. So, the curriculum is a gathering of the lessons studied by student with the destination get knowledge with support like program, facilities schools, and activities in the world of education to realize goals and school's expectations.

The Ministry of Education and Culture has introduced a curriculum named the "Merdeka Curriculum," which holds a distinct characteristic - independence. Independence, in this context, signifies the freedom to access knowledge, which can be acquired through both formal and nonformal education (Simarmata & Mayuni, 2023). This emphasis on independence marks a defining feature of the Merdeka Curriculum. The core concept of this curriculum lies in its focus on developing essential abilities such as literacy, knowledge, skills, and attitudes, while

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also fostering mastery of technology to support the demands of the 4.0 era and the 21st century.

The development of the past has led to a complete digital transformation of the curriculum in Indonesia. The emergence of the Merdeka Curriculum has been greatly influenced by digitization (Siregar & Mudjisusatyo, 2022). Under the K-13 Curriculum, teachers were required to prepare numerous teaching plans known as RPP (*Rencana Pelaksanaan Pembelajaran -lesson plan-*) (Wulandari, 2020). The abundance of lesson plans often resulted in time-consuming processes and did not yield maximum efficiency. Additionally, the curriculum's structure appeared to be flat and unstimulating, lacking the flexibility for both participants and educators to seek and deliver knowledge (Mulyasa, 2021). This deficiency prompted the need for a new approach in the development of the curriculum in Indonesia.

The Merdeka Curriculum is not directly implemented in all educational units, as the adoption of this new curriculum requires significant time for the learning process to be properly established (Irawati et al., 2022). School administrators and educators need time to understand the curriculum draft, apply it effectively, and share it with other schools. As a result, the Merdeka Curriculum remains an innovative curriculum that has not yet been made mandatory nationwide by the Ministry of Education and Culture in Indonesia (Simarmata & Mayuni, 2023).

According to the Ministry of Education and Culture, the role of *"Sekolah Penggerak"* is assigned to schools as agencies that focus on improving educational outcomes and student development through the practice of Pancasila principles, emphasizing abilities and character, guided by excellent educators and principals (Rotty et al., 2022). These schools enjoy several benefits, such as enhancing the quality of education, improving educator abilities, accelerating the achievement of Pancasila profile programs for students, becoming catalysts for change in education units, and advancing digitization in schools (Ahid & Sufirmansyah, 2022). The selection of *Sekolah Penggerak* is based on specific criteria established by the Ministry of Education and Culture (Nafisah et al., 2022). In Indonesia, a total of 2200 schools are contributing as *Sekolah Penggerak*, demonstrating a strong commitment to curriculum transformation.

Guru Penggerak refers to teachers who possess innovative, creative, and learning-skilled attributes, demonstrating energy in serving students and effectively building relationships between teachers and the school community (Faiz et al., 2022; Sibagariang et al., 2021). These teachers act as both educators and students, adapting to current student needs and the changing times while balancing modern demands with character education.

To foster active student participation, educators in encourage students to share their opinions and perspectives during classes (Le et al., 2018). This approach creates a lively and engaging classroom environment, allowing teachers to gauge students' knowledge through their insights (Jackson et al., 2019). Similar research by (Trust, 2017) has also focused on the liveliness of students and highlighted the need to improve engagement during classroom activities, such as asking questions, sharing opinions, participating in discussions, and drawing conclusions. However, some students at a senior high school in Surakarta perceive math as difficult, leading them to passively participate in class. This presents a challenge for teachers to find ways to support and instill enthusiasm for learning math. The purpose of this research is to know and describe the steps students take to overcome difficulties when learning mathematics in Merdeka Curriculum.

METHOD

This study is conducted using a qualitative approach with a descriptive method. According to (Moleong, 2018), qualitative research collects data in the form of words and pictures, rather than numbers; everything collected is essential to the research. The focus of this study is on examining existing facts, analyzing available data, and providing explanations and interpretations. The study involves participants who are educated in Phase E4 at a senior high school in Surakarta, with a total of 28 students participating.

The researchers gathered data through two methods: collecting data from educators and collecting data from the educated participants. Educator data was collected through interviews, which involves direct communication between researchers (interviewers) and the sources of information (respondents) (Thomas, 2017). Gill & Baillie (2018) further explains that interviews are conducted face-to-face using an interview guide to inquire directly about the research subjects. Additionally, data was obtained through documentation, which, according to (Sileyew, 2019), is a step used to acquire information or data that aids in the research process. Researchers utilized photos in analyzing or exploring the learning process in the classroom.

To ensure the credibility of the obtained data, the researchers needed to study relevant documents. These documents may include pictures or writings previously researched by other academics. Information was collected through questioning and observation. Hartas (2015) defines observation as the act of researchers observing the characteristics of the research subject. According to Sugiyono (2019), when the observer is directly involved in the research, the data obtained from observation is more detailed and meaningful, providing a clearer understanding of the observed behavior.

The research instrument's development process was guided by the methodology outlined by Margono (1997). To ensure clarity and reliability, the analysis variables, sub-research questions, and corresponding indicators were meticulously defined. The researchers selected appropriate instruments to measure these variables and indicators effectively. Once the initial set of questions was formulated, they were organized into a structured grid, which underwent further revisions before being subjected to testing. The finalized questions were then administered to both educators and participants, and the collected data were presented in Table 1 and Table 2.

This meticulous approach in designing the research instrument aimed to enhance the validity of the study's findings. By adhering to established guidelines and making necessary adjustments during the development process, the researchers sought to ensure that the data collected would be accurate and pertinent to their research objectives. Furthermore, the presentation of the data in Tables 1 and 2 allowed for easy reference and facilitated the examination of the research instrument's effectiveness in gathering relevant information from the study's participants.

Table 1. Interview Guideline Instrument for Teacher

A.	**Instrument Teacher's Question**
1.	What to make participants educated have a desire to be active at the moment study in the class?
2.	What triggers participants educate have no taste and want to be active in learning in the class?
3.	Who built liveliness learning taking place?
4.	When learning could make participants educate actively in the class?
5.	Where is the place that makes participant educate active in learning?
6.	Why on the spot it and the situation positive class could support participant educate active at the moment learning?
7.	How does participant education instill a sense of liveliness in learning?
8.	What is the reason participants educate not active inside class?
9.	How does the teacher respond to invite students active inside class?

Table 1 primarily consists of instruments designed to gather data from perspective teachers, enabling the researchers to gain valuable insights from their point of view. By examining the data obtained from the teachers' perspective, the researchers can better comprehend and interpret the corresponding perspective of the students or participants in the educational setting. On the other hand, Table 2 encompasses the instruments utilized to collect data directly from the students or participants themselves. This comprehensive approach in data collection from both teachers and students allows for a well-rounded understanding of the

educational dynamics, contributing to a more holistic analysis of the research questions at hand.

Table 2. Interview Guideline Instruments for Participant

B. Instruments Question Participant educate	
Indicator	Question
Will Participant educate.	1) Do you often ask in class? Give The reason! 2) Do you have a desire to be active in learning? Give Your reason!
Power Push	1) Did Master try to invite you active in learning? Tell me teacher 's invitation to invite you active in learning! 2) The place like what makes you comfortable so that you are enthusiastic to be active in lesson math? 3) Is your friend in your class listening, respecting, and caring for you the moment you try to convey what you think in class? 4) Does the teacher invite students to interact at the moment they teach?
Spirit Participant educate	1) Learning like what do you think makes you enthusiastic for an active class? 2) If you currently feel no enthusiasm to be active in lesson math, what did the teacher do to you? 3) Does the teacher give appreciation if the students are active students?

RESULTS AND DISCUSSION

Activity learning mathematics at senior high school in Surakarta was carried out with stare faces in class and with method discussion groups activity learning in class E4 taught by math's teacher discussed Rows and Lines. At the start of learning educators do ice breaking so participants educate more focus. The ice breaking form plays games together. Games played are opposite words with demonstration. Participants educate follow activity that will move her body in accordance with the opposite word is spoken educator like Figure 1 and Figure 2.

Figure 1. Participants educate Active in Ice Breaking

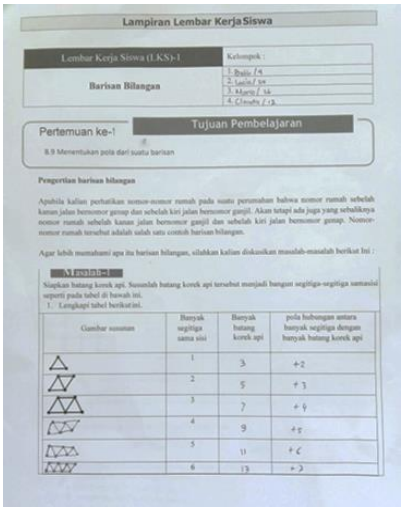
Figure 2. Participants Students who Demonstrate Wrong then Obtain Punishment in the form Truth or Dare

After ice breaking, educators convey destination learning at meetings. So, according to Paolini (2015) the role of educators can develop subject matter that will be given to students and have planned learning activities. After that educator displays a PPT (*PowerPoint*

Presentation) which contains pictures for participants to learn and remember material, in convey material contained in the PPT (*PowerPoint Presentation*) of educators and participants educate to do interaction at the time learning. Then, educators convey question as following with exists images contained in PPT (*PowerPoint Presentation).*

Educator : "How much time needed for determine the number of lines Pyramid the 12th?"

Question the Becomes lighter for entering in learning math at meetings the next educators ask participants educate to form groups of 4-5 members. Activity Sheet Student or normal LKS abbreviated by educators to group. The LKS makes guidance participants educate in understanding line numbers. Educators give freedom to participants to educate together with a group to get answers from various sources. The appearances of LKS can be shown in Figure 3, 4, and 5. Before participant educate work on the existing LKS provided educator give time if there are participant students who ask about worksheet assignment given.


Lampiran Lembar Kerja Siswa

Lembar Kerja Siswa (LKS)-1

Barisan Bilangan

Pertemuan ke-1

Tujuan Pembelajaran

8.9 Menentukan pola dari suatu barisan

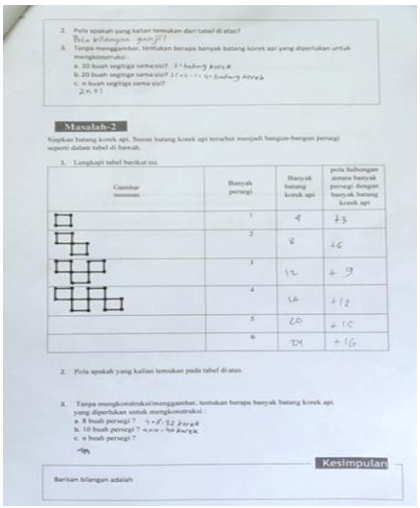
Pengertian barisan bilangan

Masalah-1

Gambar susunan	Banyak segitiga sama sisi	Banyak batang korek api	pola hubungan antara banyak segitiga dengan banyak batang korek api
	1	3	+2
	2	5	+3
	3	7	+4
	4	9	+5
	5	11	+6
	6	13	+7

Figure 3. Worksheet Appendix Student Sheet 1

Figure 3 describe about "*masalah 1*" that was gave by the teacher. Students will make many groups to clear the problem. In "*masalah 1*" page first, the problem is count from the matchsticks to be a triangle. Students count one by one the matchsticks and write the result in column this paper.


Masalah-2

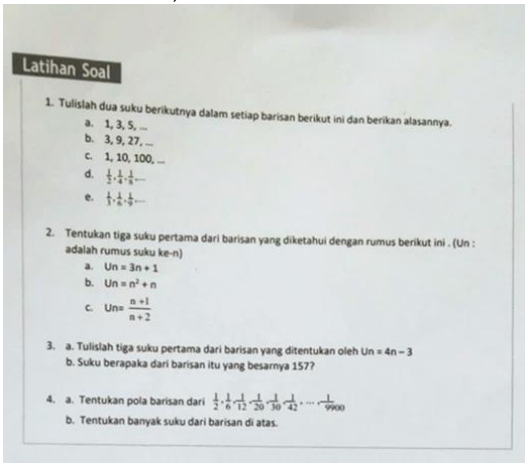
Gambar susunan	Banyak persegi	Banyak batang korek api	pola hubungan antara banyak persegi dengan banyak batang korek api
	1	4	+3
	2	8	+6
	3	12	+9
	4	16	+12
	5	20	+15
	n	24	+16

Kesimpulan

Barisan bilangan adalah

Figure 4. Worksheet Appendix Student Sheet 2

Figure 4 describes the question about number pattern and "*masalah 2*" that was gave by the teacher. Students with their group guess what the number pattern is. In "*masalah 2*" page second, the problem is count from the matchsticks to be a rectangle. Students count one by one the matchsticks and write the result in column this paper. Figure 5 is described when the students finish *masalah 1* and *masalah 2*, the students do exercise.


Latihan Soal

1. Tulislah dua suku berikutnya dalam setiap barisan berikut ini dan berikan alasannya.
   a. 1, 3, 5, ...
   b. 3, 9, 27, ...
   c. 1, 10, 100, ...
   d. $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \ldots$
   e. $\frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \ldots$
2. Tentukan tiga suku pertama dari barisan yang diketahui dengan rumus berikut ini . (Un : adalah rumus suku ke-n)
   a. Un = 3n + 1
   b. Un = $n^2 + n$
   c. Un= $\frac{n+1}{n+2}$
3. a. Tulislah tiga suku pertama dari barisan yang ditentukan oleh Un = 4n – 3
   b. Suku berapaka dari barisan itu yang besarnya 157?
4. a. Tentukan pola barisan dari $\frac{1}{2}, \frac{1}{6}, \frac{1}{12}, \frac{1}{20}, \frac{1}{30}, \frac{1}{42}, \ldots, \frac{1}{9900}$
   b. Tentukan banyak suku dari barisan di atas.

Figure 5. Appendix of Practice Questions on the Worksheet Student

After participants understand the teacher's explanation, participants educate the dynamic in a group. Educators permanently give supervision with methods around every group. Educators who visit each group often get questions from participant students and educators give questions lighter in accordance with the given LKS. Conversation like the following.

Educator : "Try now I want to ask that n what is this problem 1? "
Student 1 : "Amount triangle ma'am."
Educator : "Yes right . Then in this form the number is original . Now try group specify how many stems the lighter there is how much?"

Participants educate together and group work together in groups.

Student 3 : "Here are 3 sticks that match fire. 3-1 means 2 plus 2 parts patterns."
Student 4 : "Here are 5 sticks that match fire. 5-2 is 3 means plus 3 parts patterns."
Student 5 : "Here are 7 sticks that match fire. 7-3 is 4 means plus 4 parts patterns."
Student 1 : "Here are 9 sticks that match fire. 9-4 is 5 means plus 5 parts patterns."
Student 5 : "Here are 11 sticks that match fire. 11-5 is 6 means plus 6 parts patterns."
Student 4 : "Here are 13 sticks that match fire. 13-6 means 7 _ plus 7 parts patterns."
Student 2 : "Here form the pattern number is odd. Because it matches the fire number odd. 3,5,7,9,11,13."
Student 4 : "Oh yes right."
Educator : "Well now already got type pattern what and the table already filled. Now without drawing, how if 10 pieces triangle on the same side. How many match fires are needed?"
Student 3 : "21 sticks match fire."
Educator : "How?"
Student 3 : "1 triangle on the same side needs 3 matches ma'am. Then I multiply by 10 triangles with the same side with 3. Because one side triangle sticks with side triangle others, I subtract 1 from triangle second until triangle 10 to become 30 -1-1-1-1-1-1-1-1-1-1= 21 matches madam fire."
Educator : "Yes right. Great, carry on. Try now, how about 20?
Student 4 : "41 sticks match madam fire."
Educator : "Well if example this still number small, friends still can count then how if n so big?"

Student 1 : "how much the n?"
Student 2 : "Well that's what you 're looking for n anyway?"
Educator : "n is number original. So that's what you 're looking for in question c with method make formula."
Student 1 : "We make the formula alone?"
Educator : "Yes with see pattern from number"

After participants educate dynamic in the respective groups, educators ask participants educate to enter in class and discuss the work of each group in the LKS. Participants educate actively asked inside class about assignments on worksheets. Then, researchers see activity classroom learning that exists where participants educate active ask inside group small as well as in groups large and educators also ignite participant educate so participant educate active ask for deepen material discussed at the meeting.

Based on results from interviews with Mathematics educators in the E4 class at a senior high school in Surakarta, it was revealed that there are both internal and external factors influencing the liveliness of student participation in their studies. Internally, students' understanding of the material and their self-awareness of their educational goals contribute to their engagement (Ioannidou-Koutselini & Patsalidou, 2015; Watanabe & Mcgaw, 2003). Moreover, their interest and enjoyment of certain subjects also play a role in their active involvement in class. Externally, the connection between educators and students also plays a crucial role in fostering student enthusiasm for learning (Bryson & Hand, 2007).

Further interviews were conducted with students, and it was discovered that some students who didn't grasp the material still wanted to actively ask questions in class. The math teacher shared a similar perspective, emphasizing the importance of building positive relationships with students and employing strategies such as motivation, relaxed classroom atmospheres, praise, and rewards to encourage student engagement. Unfortunately, some students perceive math as difficult and become disinterested or lack the passion to actively participate in class.

Creating a lively learning environment is crucial for increasing student participation (Khan et al., 2017). Teachers play a pivotal role in class management and can effectively involve students by encouraging open discussions and sharing opinions (Egeberg et al., 2021; Irons & Elkington, 2021). By using appropriate teaching strategies tailored to students' needs and conditions, teachers can cultivate a positive and supportive learning atmosphere (Rusticus et al., 2023).

Incorporating adequate facilities and infrastructure and maintaining a positive environment is also essential in encouraging active student participation (Rusticus et al., 2023). The motivation for student activation comes from both the students themselves and the encouragement provided by educators (Steinmayr & Weidinger, 2019). Some students may need additional motivation and rewards to actively participate in class discussions and activities (Abdullah et al., 2012; Lin-Siegler et al., 2016). Solheim et al. (2018) research supports this idea, suggesting that students' activities and interactions increase when motivated by educators.

Based on the researcher's questionnaire given to students in the E4 class at a senior high school in Surakarta, a significant portion of students expressed a desire to be more active in their math studies to deepen their understanding. Educators actively encourage participation by inviting students to share their thoughts and answers in front of the class (Carter et al., 2015).

In the observed classroom, some students demonstrated enthusiasm and active participation, while others appeared shy and reserved. The learning environment was designed to create a comfortable, neat, clean, and quiet space to support student engagement (Rusticus et al., 2023). Additionally, incorporating group activities and Quizizz exercises further encourages active learning (Lestari et al., 2022; Zainuddin et al., 2020). For students who seem less motivated, concentration games involving body movement were introduced by educators

to boost their enthusiasm. Praising and supporting active learners also helps to maintain their engagement in the learning process.

CONCLUSION

The curriculum in Indonesia has undergone various expected changes to foster the development of education in the country and nurture the younger generation. The current curriculum developed by the Ministry of the Republic of Indonesia is the Merdeka Curriculum. The Merdeka Curriculum aims to provide participants with the freedom to seek knowledge and information independently. This emphasis on self-activity is evident among participants in class E4 at a senior high school in Surakarta, particularly during math lessons. Students actively engage in small group discussions, exchanging ideas and opinions. Furthermore, when educators initiate questions, the students actively respond. Teachers in this classroom encourage students to be enthusiastic and participate actively, both at the front of the class and among those who may be shyer or more reserved. The learning environment is designed to be neat, clean, quiet, and conducive to focused study.

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