Building the Character of Science Students through Innovative Learning Based on Process Skills During the Covid-19 Pandemic

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Abstract: The aim of this research is to describe student character through innovative learning based on process skills in class IX of Jambi Medan Private High School during the Covid-19 pandemic. This research is qualitative research, the research subjects were 34 students in class IX of Jambi Medan Private High School. Data collection techniques were obtained through interviews and questionnaires. The research results show that the science learning process in class IX of Jambi Medan Private High School during the Covid-19 pandemic was carried out offline using a shift system by applying a discovery learning model with a process skills-based approach and combined with several learning methods of mind mapping, group discussions, questions and answers and assignments. Student participation in learning during the Covid-19 pandemic was good. Students participate actively in the learning process. Assessment of student learning outcomes reaches the Minimum Completeness Criteria (KKM).

Keywords: Covid-19 pandemic; Learning outcomes; Process skills-based learning; student character

Introduction

The character of society's behavior which is actualized through non-educational behavioral tendencies is increasingly worrying, such as: violence, anarchy, pornography, corruption, acts of terrorism, and various modes of crime through information technology systems (Sudarisman, 2010). This indicates that efforts to build character through developing ethical values that are integrated into learning in schools have not been successful, there are still many teachers at various levels of education who teach using lecture, textual methods and are less based on scientific processes (Prasetiya et al., 2021). One of the contributing factors is the teacher's incorrect understanding of the lesson itself, as a result, learning has not been taught in accordance with the nature of learning which refers to processes and products but only as a product (content) (Setyaningrum et al., 2020).

Process skills-based biology learning is learning that develops various skills such as: observation, classification, interpreting, predicting, asking questions, hypothesizing, conducting experiments, communicating experimental results, so that students can have experience in activities that involve cognitive skills (minds on), manual or psychomotor skills (hands on) and social skills (hearts on) (Agustina et al., 2016; Purwati et al., 2016; Suryaningsih, 2017). Through process skills-based learning, it is hoped that various scientific attitudes can be developed, such as: patience, honesty, thoroughness, tolerance, etc., which are the basic capital in building student character (Sriyati et al., 2021). However, implementing process skills-based learning requires support from teacher readiness, both in determining strategies and learning instruments. The process skills learning model is participatory, active, creative, effective and fun learning (Bidarra et al., 2017; Kanca et al., 2020; Sinthia et al., 2021).

Science and technology (IPTEK) is an introduction to the progress of human culture (Bahri, 2017; Mulyani et al., 2021; Munir, 2019). Through science and technology, it is hoped that humans can gain knowledge in order to survive productively in their lives (Dewi et al., 2019; Genc et al., 2019; Simanjuntak et al., 2022). In this way, science and technology becomes a basic need in improving the quality of human resources (Siahaan, 2016; Tamrin, 2019; Yusutria, 2017). Globalization has touched almost all areas of people's lives, leading us to a world of almost limitless openness full of opportunities and challenges. Therefore, so that people do not get caught up in the flow of life which can diminish the values of their identity as a nation, maturity is needed as a filter in attitudes and actions. Formal education institutions have a moral responsibility to play an active and synergistic role in collaborating with related parties to prepare superior quality human resources who have professional competence, culture and character (Ma'ruf, 2016).

The current flow of globalization and the accelerated development of science and technology today is not comparable to the development of human moral awareness itself (Boelens et al., 2019; Putra et al., 2018). Nowadays, the phenomenon of declining societal behavioral values which is actualized through the trend of various non-educational behaviors is increasingly worrying, such as: violence, anarchy, pornography, corruption, acts of terrorism, and various modes of crime through information technology systems (Marijuán et al., 2020; Uoc et al., 2022). This indicates that efforts to build character through developing ethical values that are integrated into learning at school have not been successful.

Science learning basically has specific scientific characteristics that are different from other sciences (García-Carmona et al., 2018; Schizas et al., 2016). According to Carin et al. (1997) science learning includes at least 4 things, namely: product (content), process, attitude and technology. Thus, if taught according to the nature of learning, it is a strategic means for developing various aspects of learning (cognitive, affective and psychomotor) which are the basis for building students' character. Through process skills, students can be given experience in activities that involve cognitive skills (minds on), manual skills (hands on) and social skills (hearts on) (Yusuf et al., 2023). Various activities that can develop process skills include: observing, classifying, interpreting, predicting, asking questions, hypothesizing, conducting experiments, communicating experimental results (communication) (Said et al., 2017). Learning process skills is expected to develop scientific attitudes such as: patience, honesty, thoroughness, tolerance, etc., where these attitudes are the basic capital in building strong moral character in students. Based on this description, ideally science learning refers to processes, products, and even its application in life in society.

However, in the practice of learning in schools, these ideal conditions cannot yet be fully realized. In general, teachers at various levels of education in the learning process use lecture, textual methods and are less based on scientific processes, as a result the development of the three aspects (cognitive, psychomotor, affective) of students is less balanced. One of the factors causing this is because teachers tend not to understand the nature of learning correctly. Science learning has not been understood as a process and product, but only as a product (content).

As a result, teaching science is the same as simply transferring knowledge, so that learning tends to be verbal and oriented towards students' cognitive abilities. Meanwhile, developing the three aspects (cognitive, affective, psychomotor) in a balanced manner is a curriculum demand (KTSP, 2006). The development of high thinking (cognitive) abilities and (psychomotor) skills without being balanced with adequate (affective) behavior is very dangerous and can harm other people when someone has to live in society (Ali, 2018). Based on this, process skills-based science learning is an alternative effort to develop cognitive, affective and psychomotor aspects as a basis for building student character.

Method

This research is qualitative research, this research focuses on the science learning process in class IX students of Jambi Medan Private High School during the Covid-19 pandemic. The subjects in this research were 34 class X students of Jambi Medan Private High School. Data collection techniques through interviews and questionnaires. The data analysis techniques in this research are: data reduction, data presentation, and drawing conclusions.

Result and Discussion

The science learning process in class IX of Jambi Medan Private High School during the Covid-19 pandemic was carried out online using a shift system. Online learning is carried out by applying the discovery learning model of process skills-based learning combined with mind mapping methods, group discussions, questions and answers and assignments. The data in this research consists of science learning process data; student character, and student learning outcomes.

Science Learning Process

After the research data was collected, it was then analyzed using Likert scale guidelines. Data on the science learning process obtained from the analysis of student questionnaires can be seen in Table 1.

Table 1 shows the results of calculations regarding the science learning process in the process skills-based learning sub-indicator in science learning. The most frequently appearing answers were score 3, totaling 164 and the percentage results reached 83.90%. In the classroom management sub-indicator, the answer with score 3 was 36 and the percentage result reached 77.98%.

Table 1. Percentage of Results of Analysis of the Science Learning Process through Questionnaires

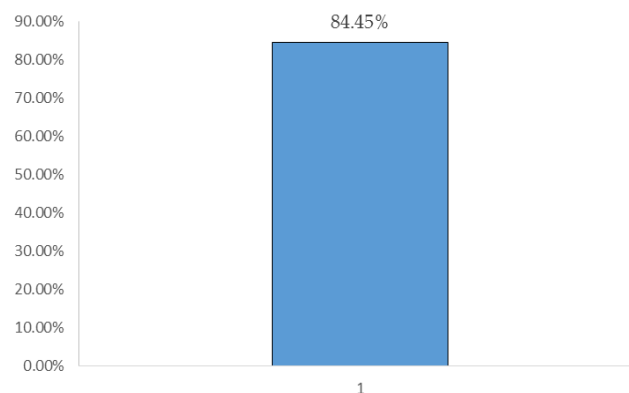| Indicator	Score	F	Total score	Total Number of Scores	Max	Percentage %
Process Skills Based Learning	4	151	604	1110	1323	83.90
	3	164	492			
	2	7	14			
	1	0	0			
Class management	4	25	100	216	377	77.98
	3	36	108			
	2	4	8			
	1	0	0			

For more details, this can be seen in Figure 1. Figure 1 shows the percentage of student questionnaire analysis results related to the science learning process which consists of 2 sub-indicators. This shows that in learning science during the pandemic, students actively participated during the learning process.
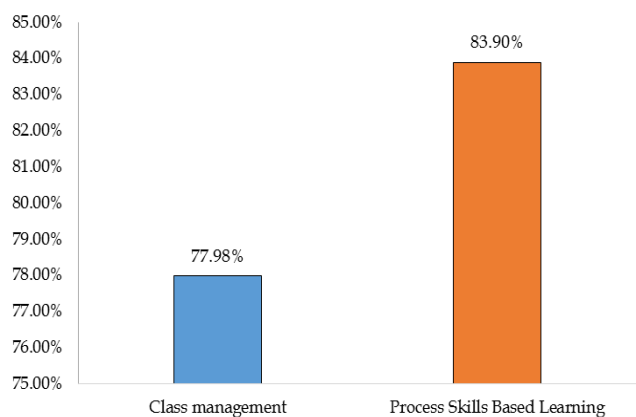
Figure 1. Percentage of student questionnaire results regarding the science learning process

Student Character

Student character data obtained from the analysis of student questionnaires is presented in table 2. Table 2 shows the results of calculations regarding the participation of students who answered score 3 the most, amounting to 63 and the percentage results reached 84.45%. Figure 2 shows the percentage of student questionnaire analysis results related to student character.

Figure 2. Percentage of student questionnaire results regarding student character

Table 2. Percentage of Questionnaire Analysis Results Regarding Student Character

Indicator	Score	F	Total score	Total Number of Scores	Max	Percentage (%)
Student Character	4	22	88	277	328	84.45
	3	63	189			
	2	0	0			
	1	0	0			

Student Learning Outcomes

Student learning outcome assessment data obtained from the analysis of student questionnaires is presented in Table 3. Table 3 shows the percentage of questionnaire analysis results regarding the assessment of science learning outcomes, the most frequently appearing answers to score 3 were 81 and the percentage results reached 82.50%.

Table 3. Percentage of Questionnaire Analysis Results Regarding Assessment of Student Learning Outcomes

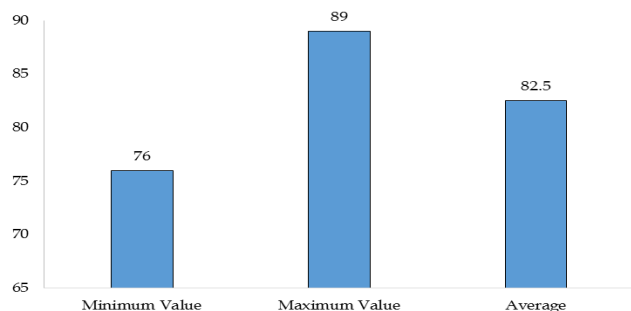|	Descriptive statistics			
Indicator	The number of students	Minimum Value	Maximum Value	Average
Student learning outcomes	34	76	89	82.50

Figure 3. Percentage of questionnaire analysis results regarding learning outcomes assessment

Figure 3 shows the percentage of student questionnaire analysis results related to the assessment of student learning outcomes.

Conclusion

Based on research, data processing and discussion, several conclusions can be drawn, including: The science learning process in class IX of Jambi Medan Private High School during the Covid-19 pandemic was carried out online using a shift system. Online learning is carried out by applying a process skills-based learning model combined with mind mapping methods, group discussions, questions and answers and assignments. Student participation in science learning during the pandemic was very active during the learning process. Apart from that, the assessment of science learning outcomes used in class The average student learning outcome score is 82.50 and is above the KKM score (70).

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