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Improving Mathematics Learning Outcomes Through the Consideration Model for Class VII Students

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ABSTRACT

Purpose of the study: The current research aims to determine student learning outcomes in class VII which are improved through the application of a decision-making model, namely the consideration model.

Methodology: This research uses the classroom action research method, the sample involved in this research is class VII students. There are several research procedures that will be carried out, namely: planning, action, observation, and reflection. The quantitative data analysis technique is descriptive statistical analysis, while qualitative data is assessed verbally when observing the learning process.

Main Findings: Based on the results of research and descriptive analysis, the average value of mathematics learning outcomes after implementing the Consideration Model in cycle I was 64.80. Meanwhile, the average value of learning outcomes after implementing the Consideration Model in cycle II was 77.83. Class VII students' mathematics learning outcomes have increased. This increase is caused by the learning techniques used which can increase student activity and reduce student tension in learning mathematics.

Novelty/Originality of this study: Previous research aimed to determine the model of consideration and value clarification in improving affective abilities. Meanwhile, this research is new in improving students' mathematics learning outcomes through the consideration model.

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1. INTRODUCTION

Learning is the process of acquiring new knowledge, skills, understanding, or experience through study, teaching, practice, or observation. It involves absorbing information, processing it, and forming new connections in our minds[1]–[3]. Learning is the way humans and other creatures gain knowledge and develop the ability to face challenges and solve problems[4], [5].Learning goals can be varied, such as increasing knowledge, developing skills, gaining a deeper understanding of the world around us, preparing for a particular job, or improving the overall quality of life[6]–[8]. Learning is also a lifelong process, because we continue to learn and develop ourselves throughout our lives.

Learning involves motivation, patience, discipline, and perseverance. The process can be fun, challenging, and rewarding. By learning, we can continue to grow and develop as individuals, and face changes and challenges in life better[9], [10]. The learning process involves several steps or stages that help in acquiring new knowledge and skills[11], [12].According to research by[13]–[15], In the learning process there are several stages that need to be known, including: goal setting, information search, information processing, practice and experience, reflection, application, and evaluation. However, each individual has their own way and learning stage to explore their desires effectively.

Learning materials can also be adjusted to individual wishes so that their knowledge is not limited to one area [16], [17]. For example, academic subject matter includes: Mathematics, English, Indonesian, Physics, Chemistry, Biology, History, Geography, Economics, Arts, and others. Academic subject matter is usually structured and based on a curriculum set by educational institutions[18], [19].Mathematics is a scientific discipline that studies the structure, patterns and relationships between numbers, quantities, space and other abstract objects[20]–[22]. Mathematics uses logic and deduction to solve problems, develop mathematical models, and test the truth of mathematical propositions. Mathematics learning is one of the materials that tends to use logic which can provide learning outcomes for students.

Learning outcomes refer to students' achievements or accomplishments in acquiring new knowledge, skills, understanding or competencies as a result of the learning process. This reflects the extent to which students can understand and apply the subject matter or skills they have learned[13], [23]. It is important to remember that learning outcomes are not just about academic achievement alone, but also involve personal growth, development of social skills, and the ability to adapt to new situations[24], [25]. Good learning outcomes reflect deep understanding, critical thinking skills, creativity, and the ability to apply knowledge and skills in a variety of contexts[26], [27].Learning outcomes can be measured through various forms of evaluation, such as exams, assignments, projects, presentations, or other assessments.

In an educational context, the use of the consideration model can help teachers or students make better decisions related to learning and education. By using the consideration model, factors that are relevant and important in the learning context can be considered and assessed better[28], [29]. By weighing various factors, such as appropriate learning methods, available resources, student needs, and individual preferences, decision making can be more holistic and informed. The consideration model is just one aspect of the decision-making process that has the potential to support efforts to improve learning outcomes[30]. It is important to consider these factors comprehensively in an effort to improve student learning outcomes.

The consideration model is a model used to consider various factors or criteria before making a decision. It involves identifying and assessing various factors that are relevant in the decision-making process. Each factor or criterion is assessed and given relative weight, then considered holistically to reach a better decision[31]. In an educational context, the consideration model can be applied when teachers or students have to make decisions that involve various factors. For example, in choosing appropriate learning methods, choosing textbooks or learning resources, or evaluating various alternatives in learning planning.

This research is motivated by student learning outcomes in mathematics subjects. The aim of this research was to improve students' mathematics learning outcomes through the consideration model in class VII. Previous research conducted by [32], aims to determine the model of consideration and value clarification in improving affective abilities. Meanwhile, this research is new in improving students' mathematics learning outcomes through the consideration model. Novelty of this research is embarking on an innovative journey in education, the 'Improving Mathematics Learning Outcomes Through the Consideration Model for Class VII Students' initiative represents a groundbreaking approach to elevate mathematical proficiency. This pioneering model transcends conventional teaching methods by integrating dynamic considerations tailored to the unique learning styles and cognitive development of seventh-grade students. By fostering a holistic learning environment, the model not only addresses conceptual challenges but also cultivates critical thinking skills, making mathematics an engaging and accessible subject for Class VII students. This forward-thinking initiative stands at the forefront of educational advancements, paving the way for a transformative learning experience that empowers students to conquer mathematical complexities with confidence and enthusiasm.

2. RESEARCH METHOD

2.1. Research Type

This type of research is quantitative research. Quantitative research is systematic scientific research into parts and phenomena and the causality of their relationships. The aim of quantitative research is to develop and use mathematical models, theories and/or hypotheses related to a phenomenon. This research uses classroom action research methods.

2.2. Population and Sample

Research location in class VII SMP. The research sample involved was 40 class VII students. The research instrument is a test sheet on learning outcomes at the end of each cycle, and guidelines for observing student activities in the teaching and learning process.

2.3. Data Collection Techniques

The data collection techniques used are divided into 2, namely qualitative data with the results of classroom observations and documentation studies to strengthen quantitative data, and quantitative data by distributing test sheets in each cycle and quantitative data. The technique of collecting data by conducting tests is one of the methods commonly used in the educational context to measure students' understanding, knowledge and skills. Tests are usually carried out in the form of questions or assignments designed to test understanding and application of subject matter. It is important to design questions that are relevant, clear, and appropriate to the expected level of student understanding [33]. In addition, it is necessary to consider factors such as fairness, validity, and reliability in the collection and analysis of test data.

2.4. Data Analysis techniques

The data analysis technique used for qualitative data is verbal assessment (observed activities) and is supported by relevant documentation. Meanwhile, quantitative data was analyzed based on descriptive statistical analysis. Descriptive statistical analysis is a method for describing and summarizing data numerically or graphically. The goal is to provide a better understanding of the characteristics and patterns present in the data collected. Descriptive statistical analysis is generally carried out before carrying out more in-depth inferential analysis or statistical hypotheses.

Table 1. Categorization of learning outcomes

Value	Category
0-34	Very low
35-54	Low
55-64	Currently
65-84	Tall
85-100	Very high

2.5. Research Prosedure

This research procedure consists of several stages, including planning, action, observation, and reflection. First, the planning stage involves formulating research objectives, selecting research methods, research design, and collecting and analyzing the data that will be used. This is the phase where the researcher details the steps that will be taken to achieve the desired results.Then, the action stage is the implementation of the plans that have been prepared in the planning stage. This may include implementing an intervention, collecting data, or implementing a particular treatment depending on the focus of the research. This stage is the implementation of the previously planned research design.After that, the observation stage involves observing the process or phenomenon being researched. Data is collected according to the research plan, and the results of observations are used to evaluate the extent to which the research objectives are achieved. Observations can involve quantitative measurements, qualitative observations, or a combination of both.Lastly, the reflection stage is the time where the researcher evaluates the results of the research and the process that has been carried out. This includes analysis of data, drawing conclusions, and presenting research findings. Reflection also involves evaluating the methods used, identifying research strengths and weaknesses, as well as suggestions for further research.Overall, these procedures provide a systematic framework for guiding research from planning to final results, ensuring the reliability and validity of research findings and providing a basis for the development of knowledge in the area under study.

3. RESULTS AND DISCUSSION

The consideration model can help improve mathematics learning outcomes if applied well and in an appropriate context. From research conducted by [32], [34], Here are some ways in which consideration models can contribute to improving mathematics learning outcomes:

1. Introduction to various learning methods: By using the Consideration model, teachers can consider various learning methods that suit students' needs and learning styles. For example, choosing learning methods that are more interactive, problem solving, or collaborative can enrich students' mathematics learning experience.
2. Identification of individual needs: In the Consideration model, teachers can consider students' individual needs and abilities. This may include adapting learning for students with different levels of understanding,

providing additional challenges for more able students, or providing additional support for students who are experiencing difficulties.

3. Selection of appropriate resources and materials: In the Consideration model, teachers can consider various resources and learning materials that are relevant to the mathematics topic being studied. Teachers can evaluate and choose textbooks, interactive media, or learning applications that suit students' needs and provide better understanding.
4. Continuous evaluation and monitoring: The Consideration Model allows teachers to continuously evaluate and monitor student learning progress. By conducting regular formative assessments, teachers can identify areas that need improvement, provide feedback, and adjust learning strategies to suit student needs.
5. Collaboration and reflection: The Consideration Model also encourages collaboration between teachers and students, as well as reflection on the learning process. Teachers and students can discuss openly about effective learning strategies, share ideas, and find solutions together. Through reflection, students can become aware of their own strengths and weaknesses in mathematics learning, thereby enabling continuous improvement.

It is important to remember that the Consideration model is a tool that assists teachers in a more informed decision-making process. Success in improving mathematics learning outcomes also depends on other factors, such as teacher competence, student motivation, a supportive learning environment, and the support provided by schools and families.

a. Improving Mathematics learning outcomes through the consideration model for class VII students

3.1.1 Description of Mathematics learning outcomes through the consideration model for class VII students in cycle I

Based on the results of research conducted on class VII students, researchers obtained and collected data through test instruments regarding the learning outcome scores of class VII students after applying the consideration model in cycle I. The test results can be seen in table 2 below.

Table 2. Score after applying the consideration model in cycle 1

No.	Name	Value
1.	AQ	56
2.	BW	50
3.	CE	60
4.	DR	71
5.	ET	100
6.	FY	62
7.	GU	61
8.	HI	65
9.	JO	52
10.	KP	55
11.	LM	71
12.	MN	72
13.	NB	71
14.	OV	69
15.	PC	100
16.	QX	50
17.	RZ	57
18.	SA	60
19.	TS	65
20.	UD	70
21.	VF	58
22.	WG	67
23.	XH	50
24.	YJ	52
25.	ZK	54
26.	IO	52
27.	PH	57
28.	GJ	62
29.	FT	72
30.	RB	65

31.	CH	100
32.	DJ	66
33.	IK	72
34.	AD	71
35.	FX	64
36.	QV	57
37.	BT	71
38.	RF	65
39.	GP	55
40.	KZ	55

In cycle I, the test was carried out after the end of the cycle which consisted of three learning meetings. The descriptive analysis of student scores after applying the Consideration Model based on the test result data above can be seen in table 3 below.

Table 3. Statistics on student learning outcome scores in the final test of cycle I

Statistics	Statistical value
subject	40
Ideal score	100
Highest score	100
Lowest score	50
Average score	64,80

Based on table 3 above, it can be seen that the average score for students' Mathematics learning outcomes after taking action is 64.80 from the ideal score of 100.00. The lowest score obtained by a student is 50 and the highest score is 100. If the student learning outcomes scores are grouped into five categories, the frequency distribution of scores obtained is shown in table 4 below.

Table 4. Frequency distribution and percentage score of class VII students' learning outcomes in cycle I

No.	Score	Category	Frequency	percentage (%)
1.	0-34	Very low	-	-
2.	35-53	Low	7	17,50
3.	55-64	Currently	13	32,50
4.	65-84	Tall	17	42,50
5.	85-100	Very high	3	7,50
Amount			40	100

From table 4 above, it shows that the percentage of student learning outcome scores after applying the consideration model in cycle I was 0% in the very low category, 17.50% in the low category, 32.50% in the medium category, 42.50% in the in the high category and 7.50% are in the very high category.

3.1.2 Description of Mathematics learning outcomes through the consideration model for class VII students in cycle II

Researchers obtained and collected data through test instruments regarding the learning outcome scores of class VII students after applying the Consideration model. The test results can be seen in table 5 below.

Tabel 5. Score after applying the consideration model in cycle II

No.	Name	Value
1.	AQ	73
2.	BW	63
3.	CE	76
4.	DR	85
5.	ET	100
6.	FY	71
7.	GU	70
8.	HI	74
9.	JO	64
10.	KP	70
11.	LM	85

12.	MN	100
13.	NB	86
14.	OV	79
15.	PC	100
16.	QX	60
17.	RZ	74
18.	SA	76
19.	TS	74
20.	UD	85
21.	VF	75
22.	WG	77
23.	XH	64
24.	YJ	74
25.	ZK	71
26.	IO	64
27.	PH	74
28.	GJ	79
29.	FT	87
30.	RB	74
31.	CH	100
32.	DJ	75
33.	IK	100
34.	AD	86
35.	FX	76
36.	QV	74
37.	BT	86
38.	RF	74
39.	GP	76
40.	KZ	62

Analysis of student learning outcome scores in mathematics learning after applying the Consideration model in cycle II based on table 5 is shown in table 6 below.

Table 6. Statistics on student learning outcome scores in the final test of cycle II

Statistics	Statistics Value
Subject	40
Ideal score	100
Highest score	100
Lowest score	60
Average score	71,83

Based on table 6 above, it shows that the average score for students' Mathematics learning outcomes after taking action was 77.83. The lowest score obtained by a student is 60 and the highest score obtained by a student is 100 from the ideal score achieved of 100. If the student learning outcomes scores are grouped into five categories, the frequency distribution of scores shown in table 7 below is obtained.

Table 7. Frequency distribution and percentage of learning outcome scores for class VII students in cycle II

No.	Score	Category	Frequency	Percentage (%)
1.	0-34	Very low	0	0,00
2.	35-53	Low	0	0,00
3.	55-64	Currently	6	15,00
4.	65-84	Tall	22	55,00
5.	85-100	Very high	12	30,00
Amount			40	100

Based on table 7 above, it shows that the percentage score of student learning outcomes after applying the Consideration model in cycle II was 0.00% in the very low category, 0.00% was in the low category, 15.00% was in the medium category, 55, 00% is in the high category and 30.00% is in the very high category.

Furthermore, table 8 shows the increase in student learning outcomes after implementing the consideration model in the teaching and learning process in cycle I and cycle II.

Table 8. Frequency distribution and percentage score of class VII students' learning outcomes after the learning process in cycle I and cycle II

No.	Score	Category	Frequency		Percentage (%)	
			Cycle I	Cycle II	Cycle I	Cycle II
1.	0-34	Very low	0	0	0,00	0,00
2.	35-54	Low	17	0	17,50	0,00
3.	55-64	Currently	13	6	32,50	15,00
4.	65-84	Tall	17	22	42,50	55,00
5.	85-100	Very high	3	12	7,50	30,00
Amount			40	40	100	100

From table 8 above, it can be seen that there was an increase from cycle I to cycle II. The most significant increase was in the low category where in cycle I there were 7 students who got low scores with a percentage of 17.50%, but in cycle II there were no more students who got low scores or with a percentage of 0%. Table 9 shows the completeness of student learning after implementing the consideration model in the teaching and learning process in cycle I and cycle II.

Table 9. Descriptive of class VII students' mathematics learning completion after the learning process in cycle I and cycle II

No.	Score	Category	Frequency		Percentage (%)	
			Cycle I	Cycle II	Cycle I	Cycle II
1.	0-64	Not finished	20	6	50,00	15,00
2.	65-100	Complete	20	34	50,0	85,00
Amount			40	40	100	100

From the descriptive results of mathematics learning completion above, it shows that the average score of student learning outcomes has increased, from 64.80 in cycle I to 77.83 in cycle II. And if categorized based on mathematics learning completeness, there are 50.00% of the 40 students who are in the incomplete category and 50.00% of them are in the complete category in cycle I. Meanwhile in cycle II there is an increase, of the 40 students 15.00% are in the incomplete category, and 85.00% are in the completed category. From the research results, it is known that there was an increase in student mathematics learning outcomes after implementing the Consideration model from cycle I to cycle II. This can be seen in the average result of the mathematics learning test in cycle I which was 64.80 and after cycle II the average result in the mathematics learning test was 77.83. The increase in learning outcomes applying this consideration model is very significant, where the percentage of mathematics learning completeness in cycle I is 50.00%, then in cycle II the percentage of mathematics learning completeness is 85.00%. In the first cycle, 20 students with a percentage of 50.00% were in the incomplete category and 20 students with a percentage of 50.00% were in the completed category. These results show that classically, students have not completed their studies because students who get a score ≥ 65 are only 50.00% less than the desired completion percentage of 85%. This is because students still feel new and do not understand the consideration model so they lack concentration on the lesson.

From the results obtained, it can be stated that completeness in the teaching and learning process has not met the desired standards of success indicators. For this reason, the researcher attempted to make improvements by continuing the research in cycle II to see how far the students' understanding of mathematics learning had been achieved. After implementing the Consideration model for cycle II, 6 students with a percentage of 15.00% were in the incomplete category and 34 students with a percentage of 85.00% were in the completed category. These results show students' completeness in learning mathematics. This happens because students already feel familiar with the consideration model, apart from that, mistakes made by researchers in cycle I are corrected as far as possible in cycle II and students are already concentrating on the lesson material so this will have an influence on student learning outcomes.

An increase in student learning outcomes occurs because students are more motivated to learn. Apart from that, there are changes in student activities where at the beginning of learning activities many students who are indifferent to the lesson finally start to be motivated to pay attention to the lesson. And it can also be seen from the increase in the number of students who are active both individually and in groups, and the level of student noise has even decreased because they feel happy learning. Based on the data above, it can be concluded that applying the Consideration model in cycle I and cycle II can improve the mathematics learning outcomes of class VII students. This can be a benchmark for success in the learning process. Research applying this consideration model has been carried out previously by[35], The results obtained show that this consideration

model is able to increase students' caring attitudes towards each other during the learning process. This is updated through current research, with the findings that the consideration model is able to improve student mathematics learning outcomes. The limitation of this research is only to improve student learning outcomes through consideration models in mathematics subjects in class VII, not carried out at a higher level.So, recommendations can be given to future researchers to expand the material they want to test so that the results obtained are varied and better.The implications of the "Improving Mathematics Learning Outcomes Through the Consideration Model for Class VII Students" are far-reaching and promising. By incorporating a tailored and dynamic approach aligned with the unique cognitive development of seventh-grade students, the model not only holds the potential to enhance mathematical proficiency but also to foster a positive and engaging learning environment. The consideration of individual learning styles and critical thinking skills signifies a departure from traditional teaching methods, paving the way for more effective and inclusive pedagogical practices. The success of this initiative could contribute significantly to the broader discourse on educational reform, emphasizing the importance of personalized strategies in addressing the diverse needs of students. Moreover, the positive outcomes of this model may extend beyond the classroom, influencing educational policies and methodologies to better cater to the evolving landscape of mathematics education for middle school students.

4. CONCLUSION

Based on research that has been carried out by processing data and strengthening it with relevant documentation studies. So, it can be concluded that there is an increase in student mathematics learning outcomes through the application of the consideration model. This is proven through a comparison of the results between cycle I and cycle II. Student learning outcomes in mathematics subjects after applying the consideration model increased from cycle I to cycle II. This is proven by the increase in the average value obtained in cycle I, namely 64.80, while in cycle II there was an increase, namely 77.83. Likewise with the percentage of completeness of learning outcomes, in cycle I the percentage was 50.00%. Meanwhile, in cycle II the percentage increased to 85.00%. Thus, the application of the consideration model can improve Mathematics learning outcomes for class VII students. After implementing the consideration model, students are generally more active in the teaching and learning process. This is proven by observations made by researchers when the teaching and learning process takes place.Researchers recommend conducting research at a higher level so that more things are known about improving mathematics learning outcomes.

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