STRENGTHENING CRITICAL CHARACTER VALUE THROUGH REALISTIC MATHEMATICS EDUCATION LEARNING APPROACH IN ELEMENTARY SCHOOL

Dr.Drs.Ramlan, M.Sn

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PANITIA PENYELENGGARA : Faculty of Social Science, Universitas Negeri Malang

MINISTRY OF EDUCATION, CULTURE, RESEARCH AND TECHNOLOGY
UNIVERSITAS NEGERI MALANG
FACULTY OF SOCIAL SCIENCE
Jl. Semarang 5, Malang 65145
Phone: 0341-551312, Fax: 0341-551921
Website: www.um.ac.id

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Ramlan

Universitas Pasundan, Jln.Taman Sari No. 6-9, Bandung, Indonesia

No. Handphone : +6285697682712

ABSTRACT

Mathematics is the focus of this research, because many think that mathematics is an abstract subject that has nothing to do with moral learning. Actually mathematics is a human culture, therefore in the learning process it must be associated with the events of human life. Realistic Mahthematics Education (RME) concept approach is an abstract mathematical concept learning approach presented in concrete form by using illustrations of real life events, so that it is related to the values of human character. Among the character values that urgently need to be developed are critical character values. Many previous researchers have conducted research with the theme of learning mathematics to develop critical characters through the RME approach, but these findings do not specify what should and should not be done during the learning process. Thus, the purpose of this study was to obtain the findings of a model for strengthening critical character values in mathematics learning through an RME approach that is easy and practical to be applied by elementary school teachers. To get the findings in question, this study uses the class action method. The conclusion of this research is that in the process of learning mathematics with the RME approach, teachers must carry out the following activities: (1) convey mathematical concepts related to real life events; (2) contains problems for students; (3) provide an opportunity for discussion and (4) provide an opportunity to get used to asking questions.

Keywords : RME approach, critical character development, Mathematics learning, Elementary School

INTRODUCTION

Education in Indonesia is not connected to the realities of life's challenges and the pace of world change in the future, including the challenges of the 21st century (Aryati et al., 2020). The behavior and thinking patterns of the Indonesian people have changed due to globalization. This causes the character and personality of the Indonesian people to experience a shift because they are easily influenced by foreign values and cultures, especially among the younger generation (Pemerintah Republik Indonesia, 2010). The educational environment is an important factor in character education to achieve the realization of national civilization. It can be said that the generation of character is the result of the great responsibility of teachers as educators in carrying out their duties (Ahmadi et al., 2020). Each subject can internalize the values of character education in students so that Civics subjects are not the only ones that can be relied on for the formation of students with character (Suwardani, 2020). Among the many subjects, some people think that mathematics is a subject that has nothing to do with ethical or moral values needed in everyday life.

New approaches are always sought and studied by creative teachers (Arifin, 2018). The importance of emphasizing the real context on what happens with daily activities can be related to the Realistic Mathematics Education (RME) approach in teaching mathematics to students (Jasija et al., 2018). In everyday life, there is the application of science by students thanks to the encouragement of mathematics learning which is always associated with its application in real life by educators (Sulastri, 2016). There is a high level of meaning for what students have learned if students are fully involved in acquiring the material and associated with its application in daily activities (Rahmawati et al., 2019).

In the concept of learning mathematics with the RME approach , teachers must always provide concrete illustrations of life events that are often seen or experienced by students, especially in elementary schools. As referring to Freudenthal who stated that mathematics is a human activity, so that the learning process must be connected with the context of daily life events in the real environment of students (Fahmy et al., 2018). Thus, that there is a correlation between the concept of learning mathematics and the concept of the RME learning approach, there is also a connection with the concept of character education which aims to make each individual beneficial to his community.

Teaching mathematics to form character, teachers to provide illustrations in the form of stories or contextual such as for example : "Anne, Mary, and John is a three companions , each person being lifted an item . Anne lifted weighing 10 kg, Mary lifted weighing 15 kg and John lifted weighing 10 kg. How much weight goods that can they raise for each child , if they decide to mutually assist in lifting he goods it ? " . Learning that relates to the topic of mathematics in school basis , namely ' operations sum and division of numbers ' and to develop the character of the participant students in cooperation (Khamidah, 2013).

In the learning process, several steps can be applied in the RME (Realistic Mathematics Education) approach : (1) Educators can guide students by reinvention how to convey problems related to the learning context, (2) Educators can apply didactic phenomena for students, namely guiding students to be able to solve problems found contextually, (3) Educators can develop independent models so that students are able to draw conclusions from previous solutions (Shandy, 2016). Education based on the context tual is how educators focus on how

students understand the material being taught significance, various benefits, how to achieve the learning objectives, and the application of science in real life demonstration (Nurdalilah, 2020).

Students with mathematical critical thinking skills who apply RME have much better mathematics learning outcomes when compared to students who apply conventional mathematics learning (Palinussa, 2013). In the Palinusa experiment, using the RME approach in learning mathematics to develop critical character in students at the elementary school level. Students' character development will be better if they apply the RME approach by students who have critical thinking skills. According to (Zubaidah, 2010), critical thinking is an ability/skill of students in accepting concepts, applying, concluding, and evaluating the knowledge obtained or the knowledge produced.

In solving the problems faced, students' critical thinking skills play an important role in addressing various problems that are obtained when participating in learning (Kurniawati, 2020). Research findings (Asdarina & Johar, 2019) state that many educators have worked to develop critical thinking characters through providing various problems that include aspects of critical thinking, but the support of educators so that students are able to improve their critical thinking is still not optimal, and teachers also rarely ask questions open about the material being taught. In addition, research findings (Susilowati et al., 2017), that students' critical thinking skills are still low. Thus, students' critical thinking skills must be improved with learning activities that have been designed by the teacher.

Research findings (Wijayanti, 2015), illustrate that the obstacles faced in the learning process in developing critical thinking for 5th graders at Primary School Kaliuntu are the lack of response to questions from the teacher and the difficult class situation to control. In contrast to the research findings (Azizah et al., 2018), that in learning mathematics, critical thinking skills have been found and demonstrated in elementary school students in Semarang. However, it takes a long time for students to solve the problem so that it becomes a student weakness. According to (Shofa, 2015), children's critical thinking skills can be honed with activities that encourage students to explore, express ideas, and solve problems.

Researchers obtained data that the findings in previous studies , especially those related to the theme of critical character development in elementary school students, the findings did not reveal in detail how the stages should be carried out by teachers and students. Thus, this study intends to make an update by revealing in detail related to the stages in learning mathematics through a model of strengthening critical character values with the RME approach. To achieve the objectives of this study, the Classroom Action Research (CAR) method was used as a relevant research design .

METHOD

Classroom action research is an effective means to realize the ideal goal of all teachers in the classroom to improve their professionalism (Miaz, 2015). This study aims that the findings can be used to improve the competence of elementary school teachers so that they can teach by developing the character of students.

Classroom action research is carried out by planning actions, implementing actions, observing and evaluating activities and results of actions, and doing continuous reflection (Taniredja et al., 2010). In this study there are several stages of research, namely:

1**. Planning**

Develop a plan for learning mathematics in elementary schools with a model of strengthening the value of students' critical character using the RME approach.

2. **Action**

A teacher teaching in a class with a number of 40 participants of the students , according to the plan of action.

3. **Observations**

Researchers make observations on students who are taking part in learning and educators who are carrying out teaching .

4. **Reflection**

Teachers and researchers reflect: evaluate, discuss notes on observations, and analyze learning activities that have been carried out. Decision making, if the results have not reached the learning objectives, then the next step is to plan corrective actions and take follow-up actions.

The researcher applied triangulation as a method of obtaining research data which consisted of observation , document analysis , and interviews with students and educators . In this study , there are data analysis techniques consisting of data reduction , data exposure , and drawing conclusions (Fauziyah et al., 2020).

RESULTS AND DISCUSSION

Realistic Mathematics Education (RME) is a mathematics learning strategy that prioritizes the presentation of mathematical concepts in the form of real events that are often seen or experienced by students. Mathematical concepts in the form of real events will motivate students to think about how to solve problems.

In summary, the stages of learning mathematics with the RME approach are: (1) the teacher conveys mathematical concepts in the form of contextual problems; (2) Students practice finding solutions according to the context of the problems that have been taught; (3) Students conduct discussions about problem solving; and (4) students with teacher direction draw conclusions, linking contextual problems with mathematical concepts. The results of this study have gone through the stages of action planning, application of action, observation, and reflection. Through classroom action research, it has been found that learning mathematics with the RME approach can develop students' critical character.

Planning

The researcher as an observer observes the activities of students and teachers from the beginning of the activity to the end of each learning process (cycle). The activities of the teacher were observed, especially in terms of the implementation of mathematics learning using the RME approach, and the students were observed, especially with regard to students' critical attitudes and behavior.

Based on the findings obtained, the researcher suggests that there are guidelines on what characters need to be strengthened or improved and evaluation efforts that can be applied to the formation of the desired character. This is in line with the achievement of character learning in obtaining data on student character development (Pusat Penilaian Pendidikan Kementerian Pendidikan dan Kebudayaan, 2019). In conducting observations, researchers refer to the criteria for the category of student character development as illustrated in Table 1, namely:

Table 1. Criteria for the Category of Student Character Development in the Learning Process

CATEGORY	STUDENT ATTITUDE AND BEHAVIOR
NS (Not Seen)	If students do not show the initial characteristics of behavior in accordance with the character that has been stated on the indicator
S V (Starting Visible)	When students have begun to show the initial characteristics of their attitudes and behaviors that stated in the indicator, after being told by the teacher
S D (Starting to Develop)	When students have demonstrated attitudes and behaviors that are expressed in indicators to see progress so that there is understanding and get support from the surrounding environment
A D (Already Develop)	When students continuously show attitudes and behaviors that are expressed in indicators with constant since understanding and realization in him

Source: (Pusat Penilaian Pendidikan Kementerian Pendidikan dan Kebudayaan, 2019)

The learning process in this classroom action was carried out at SD Nurul Hidayah Jl. Raya Cikupa Tangerang, West Java, in grade 1 as many as 40 students. Conducted for 3 times with the subject matter of mathematics 'Operation of Natural Numbers'. The main objective of this study is focused on developing critical character , especially on aspects of students ' attitudes and behavior in asking questions , during the learning process . Referring to (Wardani, 2017), that the question about the various things that relate to the material is characteristic of the ability to think critically students . Research findings (Zahranie et al., 2020) conclude that students' critical thinking tendencies have a significant and positive relationship with active questioning .

The researcher as an observer focused on the activities of all students, noting how and when they asked questions. By adopting from table 1 , researchers compiled a reference assessment and behavioral attitude of learners , especially in the aspects of the inquired, like that described in Table 2:

Table 2. Criteria for Students' Critical Character Development Score. Aspect: asking questions during the learning process

STUDENT ATTITUDE AND BEHAVIOR	SCORE	CATEGORY
Never wanted to ask questions	1- 25	NS (Not Seen)
Asking questions when the teacher asks to ask	26- 5 0	S V (Starting Visible)
Asking questions after asking other people or friends for consideration	51- 75	S D (Starting to Develop)
Always ask questions or comment spontaneously on their own consciousness	76 - 100	A D (Already Develop)

Results of Observation and Discussion

Observations of the learning process in action have been carried out for 3 cycles. By referring to table 2, observers record and analyze the observations. Until the third cycle the action was stopped because it had reached the goal with an average score of 77.38. The criteria for critical character development scores as in Table 3, namely the score range of 76-100 characters have developing criteria (AD), meaning that most students always ask or comment spontaneously.

Table 3. Observation Results Three Cycles

NO	ACTION	AVERAGE SCORE	CHARACTER CRITERIA	STUDENT ATTITUDE AND BEHAVIOR
1	first	24.75	NS	Never wanted to ask questions
2	second	6 8.75	SD	Asking questions after asking other people or friends for consideration
3	third	77.38	AD	Always ask questions or comment spontaneously on their own consciousness.

Referring to table 3, it can be concluded that learning mathematics using learning strategies with the RME approach can develop students' critical character in elementary schools. However, the specific purpose of the research is to obtain various things that teachers should do and not apply during the learning process. This can be found in the reflection notes.

Table 4. Recapitulation of Observation Results of Critical Characters of Students in first Cycle. In Aspect of Asking Questions

STUDENT	STUDENTS' ATTITUDE AND BEHAVIOR SCORE			
	Never wanted to ask questions	**Asking questions when the teacher asks to ask**	**Asking questions after asking other people or friends for consideration**	**Always ask questions and comment on your own conscience**
	(NS)	**(SV)**	**(SD)**	**(AD)**
1	25			
2	25			
3		30		
4	20			
5		35		
6	25			
7	20			
8		35		
9	25			
10		35		
11	20			
12		30		
13	25			
14		30		
15	25			
16	25			
17		35		
18	20			
19		35		
20	20			
21	25			
22	20			
23	25			
24		40		
25	25			
26	25			
27				
28	20			
29	20			
30	20			
31	25			
32	20			

33	25
34	20
35	25
36	25
37	20
38	25
39	25
40	20
TOTAL SCORE	**990**
AVERAGE SCORE	**24.75**

The interpretation of Table 4 is as follows :

- Learners no.3, no.5, no.8, no.10, no.12, no14, no.17, no.19 and no.24 their critical characters begin to appear (SV), because during the learning process they ask questions when the teacher asks to ask.
- Most (80%) of the critical character of students have not been seen (NS) , because during the learning process they never wanted to ask questions.

Thus, the action is continued in the second cycle learning process

Table 5. Recapitulation of Observation Results of Critical Characters of Students in the Second Cycle. In Aspect of Asking Questions

	STUDENTS' ATTITUDE AND BEHAVIOR SCORE			
STUDENT	**Never wanted to ask questions**	**Asking questions when the teacher asks to ask**	**Asking questions after asking other people or friends for consideration**	**Always ask questions and comment on your own conscience**
	(NS)	**(SV)**	**(SD)**	**(AD)**
1				80
2				80
3		50		
4			60	
5			70	
6			70	
7		50		
8				90
9			60	
10			75	
11			60	

12		60	
13		75	
14		70	
15		75	
16		75	
17		65	
18		65	
19		70	
20		70	
21		75	
22		75	
23		65	
24		60	
25		75	
26		65	
27	50		
28		70	
29		70	
30		75	
31		65	
32		65	
33		60	
34		70	
35			90
36		75	
37		65	
38		65	
39		70	
40		75	
TOTAL SCORE	**2.750**		
AVERAGE SCORE	**68.75**		

The interpretation of Table 5 is as follows :

The majority (87.50%) of their critical characters are still starting to develop (SD) because during the learning process they ask questions after asking other people or friends' opinions.

Thus, the action is continued in the third cycle learning process.

Table 6. Recapitulation of the Result of Observation of Critical Character of Students in the Third Cycle. In Aspect of Asking Questions

STUDENT	STUDENTS' ATTITUDE AND BEHAVIOR SCORE			
	Never wanted to ask questions	**Asking questions when the teacher asks to ask**	**Asking questions after asking other people or friends for consideration**	**Always ask questions and comment on your own conscience**
	(NS)	**(SV)**	**(SD)**	**(AD)**
1				80
2				80
3		50		
4				80
5				80
6				90
7		50		
8				90
9				85
10				85
11			75	
12				95
13				90
14				90
15				85
16	25			
17			75	
18				80
19				85
20				90
21				85
22				90
23			75	
24				85
25				85
26				95
27		50		
28				85
29			70	
30				90
31	25			
32				90

33	25				
34			7 0		
35					95
36			7 5		
37					85
38					90
39					90
40					80
TOTAL SCORE		**3.095**			
AVERAGE SCORE		**77.38**			

The interpretation of Table 6 is as follows :

- Students no.16, no.31, and no.33 have not seen their critical character (NS), because during the learning process they never want to ask questions.
- Student no. 3, no.7, and no.27 began to appear critical character (SV), because during the learning process they asked questions when the teacher asked them to ask.
- Students no.11, no.17, no.23, no.29, no.34, and no.36 their critical character begins to develop (SD), because during the learning process they ask questions after asking other people or friends for consideration. her friend
- Most (70%) students have developed their critical character (AD), because their average score has reached 7.38. Most of the students always ask and comment on their own awareness when studying in class.

Thus, the action in the learning process after the third cycle was stopped.

Results of Reflection and Discussion

First Cycle reflection notes:

- The teacher has presented mathematics subject matter, namely the concept of 'Operation of Natural Numbers' in a contextual form that relates to real events that are often seen and experienced by students.
- The teacher does not ask students to ask questions , even though the learning atmosphere is passive.

Second Cycle reflection notes:

- The teacher is in a hurry to give answers to the problems given to students, not giving many opportunities for them to find answers that they find themselves.
- The teacher does not provide supervision when students carry out discussions, so they are less serious in carrying out discussions

Third cycle reflection notes:

- The teacher has presented the subject matter of the mathematics subject, the concept of 'Operation of First Numbers' in a contextual form related to real events that are often experienced by students and contain problems that need to be solved.

- During the learning process, most students are motivated to ask questions, without being asked by the teacher.
- When discussing, the students were active and there was a pleasant atmosphere.

CONCLUSION

The Realistic Mathematics Education (RME) approach as an elementary school mathematics learning approach can develop the critical character of students in Grade 1 SD Nurul Hidayah Jl. Raya Cikupa, Tangerang, West Java, Indonesia. In the practice of the learning process, the teacher must carry out the following activities: (1) convey mathematical concepts in contextual form, relating to everyday life events that are often seen or experienced by students; (2) mathematical concepts in contextual form are intended to contain problems that can provide opportunities for students to practice problem solving; (3) mathematical concepts in contextual form must be able to invite questions for students; (4) teachers should not rush in giving answers to problems; (5) teachers to provide opportunities for discussion between students in addressing problems; and (6) the teacher provides support so that they get used to asking and commenting on the answers given by the teacher.

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