

Student character establishment in mathematics learning in elementary school during coronavirus pandemic

Deysti Trifena Tarusu, Universitas Negeri Jakarta, Department of Basic Education, Indonesia, <https://orcid.org/0000-0003-4355-8453>

Mohamad Syarif Sumantri, Universitas Negeri Jakarta, Department of Basic Education, Indonesia <https://orcid.org/0000-0002-2862-9826>

Edwita Edwita, Universitas Negeri Jakarta, Department of Basic Education, Indonesia <https://orcid.org/0000-0002-3257-0994>

Vina Iasha, SD Negeri Pondok 06 Jakarta, Indonesia <https://orcid.org/0000-0001-7801-6502>

Bramianto Setiawan*, Department of Elementary Teacher Education, Universitas PGRI Adi Buana Surabaya, Indonesia <https://orcid.org/0000-0003-4061-6363>

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Abstract

Character is an important aspect that needs to be instilled in students from an early age. However, the coronavirus pandemic has changed the learning process from offline to online so that character formation must be identified whether it is in accordance with before. This study aimed to identify the character-building process of students learning mathematics in elementary schools during the coronavirus pandemic. This study used a qualitative approach with phenomenological methods. Data were collected through observation (descriptive, focused, and selected), and interviews. The data were analyzed using domain analysis techniques, taxonomic analysis, componential analysis, and theme analysis. The research subjects consisted of students and mathematics teachers at Elementary schools. The results showed that students formed through online mathematics learning during the coronavirus pandemic were honest, disciplined, and responsible. Forming students' character in learning mathematics is carried out by exemplary methods, habituation, and inculcation of values.

Keywords: learning, mathematics, character, students, covid-19;

* ADDRESS FOR CORRESPONDENCE: Bramianto Setiawan, Universitas PGRI Adi Buana Surabaya, Indonesia
E-mail address: sbramianto@unipasby.ac.id

1. Introduction

Talking about the character is talking about the nation, the superiority of a nation, its superiority over other countries, and the uniqueness (differentiation) of the characteristics of each nation. Of course, it is not an advantage to dominate, intervene, or colonize, but a gift to be seen as equal and equal and respect each other (Rachmadtullah et al., 2020). Unfortunately, Indonesia is currently characterized by a multidimensional crisis which is reflected among others in the behavior of increasingly corrupt people, ordinary people who are increasingly fragile and disoriented, easily shaken and without orientation, show anti-social, anti-establishment attitudes, violence, and lose the balance between ratio and emotion (Yudha et al., 2020; Zulela et al., 2022). The character of the Indonesian nation, which is known to be friendly, polite, and upholds cooperation, has turned violent, scary, angry, and does not care about the nation's fate (Isha et al., 2020; Yudha et al., 2020).

One of the efforts to restore the character of the Indonesian nation's identity is through education. Education that directs and instills character is called character education. Character education is critical to continue to be developed because it is needed to strengthen the fundamental values of the Indonesian people. Character education can provide resilience for the nation and culture, therefore, as an identity, the nation's character must be owned and maintained by the younger generation in the face of the entry of foreign cultures and the rapid development of science and technology (Setiawan et al., 2017). Character education is designed and implemented systematically to instill the behavioral values of students related to God Almighty, oneself, fellow human beings, the environment, and nationality, which are manifested in thoughts, attitudes, feelings, words, and actions (Imroatun et al., 2021; Sari et al., 2020). Actions based on religious norms, laws, manners, culture, and customs.

Mathematics is a subject that can shape students' character because of the relevance of mathematical material to everyday life (Hasanah et al., 2019; Wahyudiana et al., 2021). Character-based mathematics learning is essential, and this is in line with the goals of national education, which states that education seeks to develop the potential of students to become human beings who believe and are devoted to God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent and become citizens, democratic, and responsible.

Mathematics lessons play an essential role in forming students' character, such as critical, creative, consistent, logical thinking, systematic, honest, confident, responsible, and others (Djidu & Retnawati, 2018; Susanti et al., 2022). Mathematics learning contributes to developing innovative and creative characters (Chalkiadaki, 2018; Shively et al., 2018). It also impacts the nature of students' independence and a high sense of responsibility that synergizes with the student's learning outcomes (Agus et al., 2021; Manolis & Manoli, 2021). The results of Sukestiyarno Y L's research (2019) show that mathematics learning in Denmark can build the character of independent learning, work discipline, responsibility for completing tasks, and fostering curiosity but has not been able to foster a spirit of togetherness in work. Lubis et.al. research results state that mathematics learning affects students' character. The characteristics that can be formed through mathematics learning are discipline, honesty, fairness and wisdom, good intentions, diligence, logic, rationality, critical, and creativity (Lubis & Wangid, 2019).

The implementation of character education through learning mathematics is an absolute thing to do at any level of education, especially at the basic education level. This is because primary education is the main foundation for the growth and development of Indonesia's young generation. A deep understanding of educational practice on the concept of character education is at stake for the success of character education in each unit. Although character education has been integrated into the curriculum at almost all levels of education, during the Covid-19 pandemic, which has been running for

nearly two years, the learning process has shifted by utilizing technology to convey learning messages. Online learning has emerged as an alternative to traditional education during a pandemic, increasing student satisfaction in the knowledge (Baber, 2021). Of course, carrying out this pandemic period provides new challenges for teachers to study student learning outcomes and shape students' character through learning. Learning during the pandemic requires students to learn independently. Teachers must design mathematics teaching to make it easier for students to learn and include character values in learning planning to form student character through learning mathematics.

1.1. Theoretical Framework

1.1.1. Learning Mathematics in Elementary School

Mathematics is a branch of science that has an important role in the development of science and technology, both as a tool in the application of other fields of science and in the development of mathematics itself (Hilbert, 2019). Mastery of mathematics material by students is a necessity that cannot be negotiable in structuring reasoning and decision-making in the era of increasingly competitive competition today. Mathematics is not a science that is only for its own sake, but a science that is widely useful for other sciences. Another meaning is that mathematics has a very essential role in other sciences, the main ones being science and technology.

According to Ahmad Susanto (2016) that learning mathematics is a teaching and learning process built by teachers to develop students' thinking creativity, and can increase the ability to construct new knowledge as an effort to improve good mastery of mathematical material. Ali (2016) states "Mathematics learning is a process of building students' understanding of facts, concepts, principles, and skills in accordance with, the teacher conveys the material, students with their respective potentials construct their understanding of facts, concepts, principles, and skills as well as problem solving."

In general, the purpose of learning mathematics in elementary schools is for students to be able and skilled in using mathematics. In addition, learning mathematics can put pressure on reasoning in the application of mathematics in everyday life. Istarani stated that there are goals for teaching mathematics in elementary schools as follows: (1) Growing and developing numeracy skills (using numbers as a tool in everyday life), (2) Growing students' abilities, which can be transferred, through mathematical activities, (3) Developing basic knowledge of mathematics as a further result in Junior High School (SMP), (4.) Forming logical, critical, careful, creative and disciplined attitudes (Istarani & Siddik, 58 C.E.).

1.1.2. The Nature of Character Education

Character can be seen as a way of thinking and behaving that is unique to each individual to live, socialize, and work together in the family, community, nation and state environment. Good character is shown by morals, character, and behavior that is commendable and becomes an example in the midst of family, community, and nation. Arthur distinguishes the notion of character in several ways. First, character is seen as an interweaving of personality values that lead to something normal. Character is about who we are and what we become, the good and the bad. Second, character is not something that is fixed and can be easily measured or modified. Third, character is choices about the direction of right or wrong actions and thoughts. Arthur believes that a person can be active in shaping the character of himself and others (Arthur, 2003).

Character education as a holistic educational process that connects the moral dimension with the social realm in students' lives as the foundation for the formation of a quality generation. The quality generation is characterized by its ability to live independently and have the principle of a truth that can

be accounted for in value. Character education is an effort made individually and socially in creating a conducive environment for the growth of children's individual freedom (Raharjo, 2010). Character education is a dynamic of continuous ability development in humans to internalize values so as to produce an active and stable disposition in individuals (Koesoema, D, n.d.).

Character education aims to facilitate students to be able to use knowledge, examine and internalize and personalize values, develop social skills that allow the growth and development of noble character in students and manifest it in daily behavior, in various socio-cultural contexts that are diverse throughout life (Nurul, 2010).

1.2. Relate Research

From the literature review, it is seen that various studies have been carried out about the established of students' characters in the mathematical learning. Djidu et.al. in their research conducted the identification of character values appearing from their developed model namely, the Cultural values-integrated mathematical learning model. This research showed that the character values of students' that have been developed through the implementation of the learning model are responsibility, tolerance, and positive attitudes toward mathematics learning process (Djidu & Retnawati, 2018).

Kurniawan & Muqowin conducted research related to the students' characters that appear in learning mathematics in elementary schools. This study was conducted using qualitative methods. The results of the study indicate that learning mathematics contains many character values that can be imitated including religious values, discipline values, honesty values, hard work values, critical, logical, and creative thinking values. and innovative values, curiosity values, communicative values, independent values, responsibility values, self-confidence values, democratic values, reading values, fair values, compassion, and friendship (Kurniawati & Muqowim, 2021).

Furthermore, the results of Sukestiyarno Y L's research (2019) show that mathematics learning in Denmark can build the character of independent learning, work discipline, responsibility for completing tasks, and fostering curiosity but has not been able to foster a spirit of togetherness in work. Lubis et.al. research results state that mathematics learning affects students' character. The characteristics that can be formed through mathematics learning are discipline, honesty, fairness and wisdom, good intentions, diligence, logic, rationality, critical, and creativity (Lubis & Wangid, 2019).

2. Method and Materials

2.1. Research Model

This study used a phenomenological qualitative approach that focuses more on the concept of a particular phenomenon to see and understand the meaning of an experience related to a specific field of phenomenon field (Sundler et al., 2019; Yudha et al., 2020). A phenomenological qualitative approach is used to describe the process of character building for elementary school students through learning mathematics during the COVID-19 pandemic.

2.2. Participants

This research was conducted in several elementary schools in Depok City, Indonesia from July to December 2021. The subjects were selected using purposive and snowball sampling. Purposive sampling is a random sampling methodology in which the targeted sample group has certain attributes (Andrade, 2021). The snowball sampling technique is a technique for determining the sample which is initially

small in number, then this sample chooses its friends to be used as samples, and so on so that the number of samples becomes large (Leighton et al., 2021).

2.3. Data Collection Tools

Data were collected through observation (descriptive, focused, and selected), and interviews. Observation is a technique of collecting data by observing the ongoing activities at the research location (Gestsdóttir et al., 2018). The interview is one of the data collection techniques where the researcher comes face to face directly with the respondent or the subject under study. They asked the respondent about something that had been planned. The results are recorded as important information in the research (Shaw, 2019).

2.4. Data Collection Process

Observation data was obtained by looking at the process of character building during online learning from July to December 2021. Interview data were obtained by conducting interviews with teachers and students in each elementary school. At first, we selected respondents with a small scope but later expanded to get more accurate data.

2.5. Data Analysis

The data analysis procedure in this study uses the James Spradley approach, which includes four steps; (1) domain analysis, (2) taxonomic analysis, (3) componential analysis, and (4) theme analysis (Thomas, 2019).

3. Finding And Discussion

3.1. Finding

Based on the results of interviews and observations made during the research process in the field. Several ways in the process of forming student character were found through online mathematics learning during the covid-19 pandemic. This method adapts to teaching and learning activities and student character. In general, the forms of character building include; habituation, exemplary, and Value Cultivation.

3.1.1. Habituation

Character formation is an effort to improve individual behavior that continuously involves knowledge, feeling, and acting (Vos, 2018). Character formation can be done with a pattern of habituation. Character does not happen instantly, but it takes a long time. The habituation pattern is made by repeating the values internalized in students through behavior. Of course, these behaviors must be introduced gradually and practiced in everyday life. Habituation will not be carried out without exemplary. Based on the observations of habituation of disciplined characters in elementary school students, teachers were familiarizing students with being absent early before online learning was carried out and emphasizing students to submit assignments on time. The results of the researcher's interview with one of the mathematics teachers:

"Students are always accustomed to praying before and after studying, advised to attend earlier before the learning process begins, students are reminded to do assignments according to the rules or solving methods that are by mathematical rules, for example, in tasks related to mixed operations students must do multiplication or division. First, then do addition or subtraction, and students are accustomed to collecting assignments according to the set time (CWG6)"

"We as teachers continue to emphasize to children to be disciplined, for that in the teaching and learning process, the habit of discipline must be raised. Usually, we remind students to be present on time for learning, do practice questions according to the correct stages or steps for completion, and remind them to submit assignments according to the allotted time" (CWG 1)."

3.1.2. Exemplary

Exemplary is the best way to teach the values of truth to children because children understand more quickly from what they see directly than what is taught orally or in the writing (Siahaan et al., 2019). Teachers believe this value is an exemplary method for educating and teaching children. Students' character reflected in behavior can be formed from imitation through seeing, hearing, and following. Therefore, building character cannot provide material or knowledge about morality. Still, more emphasis is placed on direct practice by teachers (educators) so that students (students) can emulate. Teachers teach several character values to students through exemplary learning, including responsibility, honesty, and discipline.

First, the character of responsibility is one of the many characteristics that a student must have. One of the media that can shape the character of children's responsibility is the example of responsibility in learning mathematics. This is according to the results of interviews between researchers and teachers:

"Mathematics learning does not only talk about numbers but in it, there are values that can shape the character of students, such as the character of responsibility, discipline, honesty, etc." (CWG 3).

"Mathematics learning requires character values, and to ensure that character values are conveyed depending on how the teacher teaches it, Alhamdulillah so far we have emphasized the value of these characters through learning mathematics. For example, we tell students that the teacher's responsibility is to teach sincerely until students understand and teach it in the best method to digest it easily. It is hoped that with students seeing our seriousness in teaching, it will also form a sense of responsibility for students to learn and do the tasks given properly and correctly" (CWG 5).

Second, the honest character is human behavior based on efforts to make himself a person who can be trusted in words, actions, and work, both towards himself and other parties (Barlian, 2020). Practicing honesty in children from an early age needs to be done so that later children can grow up to be good people and be trusted by everyone. The results of the researcher's interview with the mathematics teacher:

"Honest character needs to be taught to children from an early age because changing people's behavior as adults is very difficult. For this reason, when teaching, we pay great attention to that, one of the ways we teach moral values to students is by being honest in assessing student worksheets, and of course, we also always advise students to be honest during tests, etc." (CWG 2).

"Every time we start learning, we always remind students to be honest at any time, whether it's when studying at school, at home, or in the community. We often remind ourselves to do math assignments honestly, that is, we shouldn't cheat on our friends' work, or we shouldn't tell our parents to do it" (CWG 4)

Third, the character of discipline Discipline is the ability to control behavior that comes from within a person by things that have been regulated from outside or existing norms (Downe et al., 2016). The character of discipline is significant for students because this disciplined attitude will make students obey or obey school rules, study hard, and obey teacher directions. This is the statement of one mathematics teacher.

"It is important to teach the character of discipline to students, because it is the discipline that makes students obey school rules, for example being on time, dressing neatly, etc. And one way to teach the value of discipline to students is by setting an example. For example, we as teachers must attend school earlier than students" (CWG 6)

"We as teachers are an example for our students, exemplary disciplined attitudes that we teach students in learning mathematics, such as working on problems systematically, gradually by mathematical rules (CWG 3)".

3.1.3. Value Cultivation

Building character can be done by instilling values in teaching mathematics to students so that it has a good impact on everyday life. For these values to be meaningful to students, teachers must meet several prerequisites, including 1) being able to understand mathematics learning material and support the abilities or attitudes that will be developed; 2) being able to formulate values developed through short sentences full of meaning; 3) able to direct/teach the material by using contextual examples that can be analyzed according to the values developed; 4) able to explain the consequences of deviations in values developed both theoretically and in their application in society. The character of student discipline is the character or behavior of obedient and orderly students under various rules and regulations. Discipline character is very important for students to develop themselves to achieve a happy life, socialize and adapt well to a social environment. The results of interviews with several teachers are as follows.

"When studying online, I always give 10 minutes earlier notice to students to get ready to take online lessons through the Zoom meeting application, and when studying students are reminded not to be alone at home, so they don't focus when studying, for example, students should not often leave the cellphone during zoom meetings" (CWG 1).

Moral values through inculcating character values such as teachers being natural in carrying out learning, assessing student assignments, and encouraging students to be sensitive to students' abilities, traits, and differences of opinion (CWG 2).

4. Discussion

Character formation is an effort to improve individual behavior that continuously involves knowledge, feeling, and acting (Sumantri et al., 2022). The character-building process is seen as a conscious and planned effort, not an effort that occurs by chance. On this basis, forming character is done through character education. Character education is a genuine effort to understand, shape, and foster ethical values, both for oneself and all members of society as a whole (Baehr, 2017; Sumilat et al., 2022). Character education aims to develop the values that shape the nation's character, namely Pancasila, including; 1) developing the potential of students to become human beings with good hearts, think well, and behave well 2) building a nation with Pancasila character, 3) develop the potential of citizens to have self-confidence, be proud of their nation and country and love others.

Character education innovation contains that character education is carried out in an integrated manner in all subjects. The integration in question includes the loading of values into substance in all

subjects and the implementation of learning activities that facilitate the practice of values in every action inside and outside the classroom. Responding to the innovation of character education, of course, mathematics can be used as a tool to shape the character of elementary school students. Mathematics is one of the subjects that can be a tool for developing student character because it is related to everyday life (Gravemeijer et al., 2017).

Character-based mathematics learning is very important. This is in line with the goals of national education, which states that education seeks to develop the potential of students to become human beings who believe and are devoted to God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent and become democratic and responsible citizens. According to Abdullah (2019), character education-based mathematics learning involves various elements (field of study, students, teachers, and the environment). It cannot be simplified into a concept.

Learning mathematics during the COVID-19 pandemic challenges teachers to change the teaching pattern that used to be face-to-face mathematics learning (PTM), now switches to online learning at home. In face-to-face learning (PTM), teachers can interact directly with students, making it easier to deliver learning materials and monitor student development. Teachers can show exemplary attitudes and behaviors that students can observe now. The situation and circumstances are different from before, where the interaction space between teachers and students is limited since the government imposes online learning. Despite all these obstacles, the teacher must still design effective mathematics learning. The teacher intentionally includes character values in education planning to form student character through mathematics learning. In the process, character-based mathematics learning is not taught but developed in an integrative way in learning mathematics through example, habituation, and inculcation of character values.

Exemplary is the best way to teach the values of truth to students because students understand more quickly from what they see directly than what is taught orally or in writing. The teachers believe this value is an excellent method to shape students' character. Therefore, building character cannot be done by providing material or knowledge about the character. Still, more emphasis is placed on direct practice by the teacher to be imitated or imitated by students. Examples of exemplary attitudes by teachers such as; the teacher teaching an attitude of responsibility by the teacher are always present in every lesson schedule, the teacher guiding the value of discipline by being absent early in the Whatsapp group, and the teacher teaching an honest attitude by assessing student worksheets correctly and honestly. The student's character, reflected in behavior, can be formed from imitating through seeing, hearing, and following the example of the teacher's attitude.

Dewia's research results show that teachers are role models or real examples for students to provide character education (Dewi & Alam, 2020). The results of Lohr et al. research that the example of a teacher is an important factor in the success of teaching and learning activities, where the teacher is the main character in the school who must set an example for students and teach them to have good character, for that the example of a teacher needs to have priority in the formation of the character of their students (Lohr et al., 2021).

Habituation patterns can do character formation. Doing positive things is one way to instill character values in students. For example, teachers train students to read prayers before and after learning mathematics online, always advise students to do math assignments, teachers teach students to be disciplined by setting a deadline for collecting math assignments, and teachers always give readings at the end of each lesson to shape student attitudes. Characters happen instantly but take a long time to

process. The pattern of habituation is made by repeating the values that will be internalized in students through behavior. The research results by Wood show that children's character emerges from a habit repeated for a long time, and there is an example from the surrounding environment (Wood, 2017). Of course, these behaviors must be introduced gradually and practiced in everyday life. The results of Hermino and Arifin's research that the formation of student character can be done by providing an understanding of positive actions, then providing opportunities to do positive things, then developing them, and finally cultivating these positive actions (Hermino & Arifin, 2020).

Character building can be done by instilling character values in teaching mathematics to students so that it has a good impact on everyday life. The results of research by Noviani Achmad Putri that forming values in character education can be through the cultivation of character education values in each subject (Putri, 2011). Many characteristics need to be instilled in elementary school students through mathematics to become qualified human resources, including discipline, honesty, and responsibility. According to Hendriana, learning plays an important role in shaping students' character, such as critical, creative, consistent, logical thinking, disciplined, honest, responsible, and other (Hendriana, 2014). To instill a disciplined attitude towards students, the teacher determines the time to learn mathematics online and makes rules regarding polite and neat procedures when participating in online mathematics learning. To establish honesty, the teacher advises students not to cheat on a friend's worksheet or ask other people to do the math task of the student concerned. Meanwhile, to shape students' character, the teacher always gives math assignments and collects them according to the time determined by the teacher.

5. Conclusion

Research on identifying the process of character-building students in learning mathematics in elementary schools during the COVID-19 pandemic has been successfully carried out. The results showed that students formed through online mathematics learning during the covid-19 pandemic were honest, disciplined, and responsible characters. In the exemplary aspect, the teacher teaches an attitude of responsibility by the way the teacher is always present in every lesson schedule, the teacher leads the value of discipline by being absent early in the Whatsapp group, and the teacher teaches an honest attitude by assessing student worksheets correctly and honestly. Furthermore, in habituation, the teacher accustoms students to reading prayers before and after learning mathematics online, always advising students to be honest in doing math assignments.

The teacher conditions students to be disciplined by determining the deadline for collecting math assignments and the teacher always gives lessons at the end of the day. They were learning to form the attitude of student responsibility. Then, in inculcating values, to instill a disciplined attitude towards students, the teacher determines the time to learn mathematics online and makes rules regarding polite and neat dress standards when participating in online mathematics learning. To form an honest character, the teacher advises students not to cheat on their friends' worksheets or ask other people to do the math assignments of the students concerned. Meanwhile, to form the character of student responsibility, the teacher always gives students math assignments and collects them according to the time determined by the teacher.

6. Recommendations

Several recommendations need to be considered for further researchers interested in researching the character building of elementary school students through online learning of mathematics, namely testing the effectiveness of students' character building in online and offline learning.

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