

**Research article**

# Identifying How Online Learning Can Be Used to Embed Character Values in Mathematics Learning in Elementary Schools

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**Abstract.**

Mathematics learning is assessed from the aspect of knowledge, but the cultivation of character values can also be integrated. The COVID-19 pandemic has shifted the procedure for learning mathematics from face-to-face to online learning. The purpose of this study was to identify how online learning can instill character values through mathematics learning in elementary schools. This was descriptive qualitative research conducted at Yogyakarta Special Region elementary school, which was selected through purposive mechanisms. The research subjects were selected by teachers in the elementary school. Data were collected through observations, interviews, and documentation analysis. The results indicated that the identification of character values with online learning was prepared by the teacher by making learning tools such as syllabi, lesson plans, worksheets, teaching materials, and evaluations that integrated character values. Instilling character values was pursued by the teachers in creating learning videos for initial activities, core activities, and closing activities. Mathematics learning employed YouTube and WhatsApp media for discussion and collection of math assignments. Instilling character values in mathematics learning was very limited by teachers because of the obstacles that occur during the mathematics learning process, such as lack of technology, poor internet networks, inadequate internet packages, and teachers who have not mastered technology optimally.

**Keywords:** online learning, character values, mathematics learning

## 1. Introduction

Education in Indonesia is currently building a learning process that integrates character education in every lesson. The 2013 curriculum, which contains formulas related to the inculcation of character values in students, is the first step in the process of improving educational goals in Indonesia [1]. The importance of teaching character to students as a baton for planting the noble values of the Indonesian people so that they can be implemented in everyday life. The Ministry of National Education mentions three functions of character education, namely, (1) developing basic potentials to be good-hearted, have good thoughts, and have good behavior; (2) strengthening and building multicultural national behavior; (3) increasing the civilization of a nation that

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Published: 28 September 2022

Publishing services provided by Knowledge E

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Selection and Peer-review under the responsibility of the ICESRE 2021 Conference Committee.

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is competitive in world relations [2]. This is reinforced by Presidential Regulation of the Republic of Indonesia Number 87 of 2017 concerning Strengthening Character Education or what is commonly called PPK in Article 2 states that PPK has the goal of building and equipping students as the golden generation of Indonesia in 2045 with the spirit of Pancasila and good character education to deal with the dynamics of change in the future and education as the main soul in the implementation of education for students [3]. These rules are the basis for the process of cultivating character values as a current educational goal by integrating them into existing subjects in school.

The challenge as an educator with the integration of character education in all subjects requires that teachers be able to instill character values in the learning process. Mathematics as one of the subjects in Elementary Schools makes it a challenge for teachers when instilling character values that must be integrated into these subjects, especially during the Covid-19 pandemic like now with an online system requiring teachers to have creativity in delivering material through online media. The application of character education can adapt to students' environmental conditions because students' needs are not only in understanding mathematical concepts but also related to values and character [4]. Therefore, teachers and the school as the spearhead of knowledge transformation need to develop strategies in implementing character education in every subject, including mathematics. One of the strategies applied is in the process of preparing learning tools that can assist teachers in achieving learning objectives. As in the research conducted by Anugraheni (2018), the product of creative character education-based mathematics learning tools for grade IV of Elementary Schools that get the category of results worthy of use [5].

In addition to preparing learning tools, teachers must also have skills in the implementation of learning which are the key to success in achieving the planned learning objectives. To become a professional teacher, a teacher must have good teaching skills, broad insight, master learning media and technology, a good personality, and be a role model [6]. Besides having field knowledge, general knowledge, and pedagogic knowledge to achieve educational goals, teachers must have character education competencies [7]. It is in this learning process that the teacher can instill character values in students so that they become humans who have superior character according to the identity of the Indonesian nation. An integrated strategy in implementing character education in schools according to Lickona includes integrating character education content that has been formulated into all subjects, integrating character education into daily activities at school, integrating character education into programmed or planned

activities, and building communication and collaboration. between the school and the parents of students [8].

Learning Mathematics as part of the subjects taught in elementary schools has different content from other subjects. The Ministry of Education and Culture stated that mathematics requires a more detailed and specific study when compared to other subjects [10]. Learning mathematics requires 4C thinking skills, namely Critical, Creative, Collaborative, and Communicative. Learning mathematics is not only about right and wrong but has other tendencies that students must have, such as the thought process of using symbols, pictures, diagrams, and models<sup>10</sup>. Assessment of mathematics learning in Elementary Schools, although there is a separation between high and low classes, for assessment remains the same as in assessments of other subjects consisting of affective (attitude) assessments, cognitive assessments (knowledge), and psychomotor (skills) assessments. Regulation of the minister of education and culture Number 21 of 2016 concerning Basic and Secondary Education Content Standards states that there is a spiritual assessment contained in Core Competency 1, aspects of attitude in Core Competency 2, aspects of knowledge in Core Competency 3, and aspects of skills in Competence 4 [11]. Ability The teacher as the main point in learning mathematics makes the teacher must have the ability to develop a creative and innovative learning process while still providing character planting according to the assessment designed by the Ministry of Education and Culture, especially in Core Competencies 1, 2, and 4 which promote the process of spiritual cultivation, attitudes and student skills. In this case, the teacher as the holder of power in the class must instill character values including by doing the process of familiarizing students to act by the values instilled. This habituation can reflect long-term memory representations obtained from the learning process [12]. So this study focuses on identifying the inculcation of character values that teachers apply to mathematics in elementary schools.

## 2. Method

This type of research used in this research is descriptive qualitative. The research locations in the Yogyakarta Special Region Elementary School are as follows.

Researchers determine research subjects through a purposive mechanism. The research subjects chosen are people who can provide information related to the identification of the inculcation of character values in mathematics in elementary schools. The data collection instruments used observation guidelines, interviews, and study documentation. This observation sheet is used to collect data where the

TABLE 1: School data studied.

No.	School name	Observation Code	Interview Code
1	Sekolah Dasar Muhammadiyah Wirobrajan 1	O1	T1
2	Sekolah Dasar Negeri Tamansari 2	O2	T2
3	Sekolah Dasar Negeri Ngrukeman	O3	T3
4	Sekolah Dasar Negeri Tlogo	O4	T4
5	Sekolah Dasar Negeri Sonosewu	O5	T5

researcher makes direct observations of the symptoms of the subject to be studied related to the identification of the inculcation of character values in mathematics in elementary schools. Collecting data by asking directly to the research subject, in this case, the teacher. This research is to obtain documentative supporting data in the form of pictures, writings, and school archives such as syllabus, lesson plans, student worksheets, teaching materials, assessments, school regulations. The technique of checking the validity of the data used triangulation of data by comparing the results of interviews with the contents of documents, observations, and other sources related to research studies and providing mutual reinforcement regarding the identification of the inculcation of character values in mathematics in elementary schools. While the data analysis used is data collection, data reduction, data presentation, and concluding.

### 3. Results and Discussion

This section will explain the results of research that has been carried out regarding the identification of the inculcation of character values in mathematics learning in elementary schools. The research conducted is still under the influence of the Covid-19 pandemic, which

changes the implementation of face-to-face learning in class into learning with online concepts. Online learning that takes place uses several social media as a tool in the teaching and learning process carried out between teachers and students. Social media used include YouTube to provide lessons made by teachers by uploading videos that have been made, WhatsApp is used if there is a discussion process about learning,

assigning assignments, and submitting assignments. This is the obstacle faced even in all schools in Indonesia, whether experienced by teachers or students. In research that focuses on identifying the inculcation of character values in mathematics learning in elementary schools, the researcher made observations about teacher preparation by integrating character values in mathematics learning with the following results.

TABLE 2: Observation of preparation in planting the character values of learning mathematics in elementary.

O1	O2	O3	O4	O5
It is very good because the teacher plans to learn in an orderly manner, namely the Learning Implementation Plan, Syllabus, media, rewards, teaching materials, and Student Worksheets. The tools that have been prepared by the teacher contain the inculcation of character values such as honesty, responsibility, discipline, self-confidence, and others.	Prepare activities that will be carried out during the learning process, make RPP, LKP, or LKS, syllabus. But online learning is currently the teacher giving a link on youtube. Regarding the integration of character values, it has been stated in KI, KD, indicators, processes, and products.	Prepare yourself and the material to be taught such as online lesson plans, syllabus, worksheets, and evaluation questions to check student understanding. Learning tools that are made contain character values.	Completeness of designed learning tools by looking for material in teacher books and student books and look for other references on google. The inculcation of character values is already written on the learning device according to the provisions contained in the teacher's book	The teacher prepares the material, by making a syllabus and lesson plan (RPP) for each lesson, teaching materials, media, and student observation sheets. For planting character values it is written in the learning tool, namely the lesson plan implementation in learning steps

These results indicate the preparation of the teacher in the mathematics learning process has been prepared as well as possible, namely preparing learning tools as a basis for implementing learning to students. Character values as an assessment that are required in the learning process have also been included in teaching documents such as the syllabus, lesson plans, materials with the media and models to be applied, and evaluation sheets. In preparation for teaching the teacher must know the basic competencies to be applied, what to do and learn, how to learn them, and how the teacher must know that students master these competencies [13]. With the learning planning, it is hoped that there will be a direction of learning activities for the achievement of goals, making estimates related to potentials and obstacles in the learning process, and arranging priority scales [14]. In the mathematics learning process, researchers conducted interviews with teachers to find out how the process was carried out in planting character values. The results of the interview are as follows.

TABLE 3: Results of interviews with teachers in planting the character values of mathematics learning.

T1	The character planting method is integrated with the material presented. The medium can use the learning material itself. The strategy is to link the material with the characters to be implanted and most importantly exemplify it. Cultivating character in integrative thematic mathematics learning, for example by provoking a child's curiosity, getting used to being diligent, disciplined, and honest, for example when working on assignments from teachers, students do things honestly without cheating their friend's. Students discussing with their friends is one of cultivating cooperative character, giving assignments which are one of planting honest and disciplined characters, and making anecdotal record observations.
T2	Cultivating character in children in interactive thematic mathematics learning in teachers, usually, I instill the greatest religious values first, because not all children like mathematics, I instill it to be patient, remain sincere and eager to seek knowledge, then I instill an attitude of honesty and responsibility answer, discipline, hard work, curiosity, and always think logically, creatively, and innovatively. I also judge from a brave child, wants to know high and I prioritize religion because learning mathematics requires patience and serious effort.
T3	Giving assignments to students that are done individually should not be cheated or should not encourage parents to do it. Because in that way the teacher can instill in the child the form of character, wise, responsible and independent.
T4	It can only be seen from the collection of tasks during the pandemic, namely assignments collected directly to the school, some are collected directly when there is an assignment, some are once every three days, some are once a week, some go through assignments in photos and then send them via WhatsApp when depositing assignments, the teacher can see the students' sense of responsibility for the assignment.
T5	The teacher observes student behavior during the learning process but during online school, there are difficulties in assessing student character because it is not seen directly. For example, asking students to pray before starting learning, the teacher cannot see directly whether students are praying or not. The teacher looks at the results of student work whether they have been sequenced according to the steps for solving the questions or not.

Cultivating the character values of a teacher does this by integrating the use of media, models, or strategies that are applied to instill character in students. Cultivating character is also essentially by familiarizing students with the process of application in the life of each student. Strategies to develop character by consistent habituation, modeling, intervention, and strengthening [15]. The learning process with a face-to-face system makes it difficult for teachers to instill character values by the learning implementation plan that has been made. Learning mathematics, which some students consider difficult learning adds to the challenge for the teacher, for example in instilling the value of honesty in doing assignments. The character of students that can be assessed from the observations of a teacher can be known starting from the beginning of learning, core activities, and working on assignments by students at the end of learning. The initial activity is carried out by praying according to students' religious beliefs, at the core of learning by observing student behavior in the learning process, discussion, and problem-solving in mathematics material, math problems, and discipline, responsibility, independence, honesty at solving math tasks that are given to students.

Online learning becomes difficult in monitoring each student whether the assignment is done independently or asking for help from others and does not know the learning process carried out in each student’s home. However, from the observations about the Mathematics learning process in instilling character values, the teacher still tries to instill character values. The results of these observations are as follows.

TABLE 4: The mathematics learning process in instilling character values.

O1	Thematic mathematics learning by providing learning videos by integrating character values in media methods and models and learning strategies. However, the process is constrained because it cannot be face to face. The process of instilling character values itself by giving students an apperception to provoke students to think critically, and giving individual and group assignments to instill honest and cooperative character.
O2	The learning process carried out to instill character in children is adjusted to K1, K2, K3, and K4. The process of cultivating character in mathematics learning is extra low for low classes compared to high classes, most children can read but do not understand what is meant in the reading. However, different from the high class, most understand the reading but do not know how to do it, but character planting even though online teachers try to instill religious values, honesty doing assignments, responsibility for assigned assignments, discipline, hard work without telling parents to do, curiosity about the material in learning mathematics.
O3	Through online media when starting learning, it always begins with praying, when the learning material always links moral messages to raise student awareness. Enthusiastic in participating in classroom learning even though it is online, disciplined, and responsible for the assignments given by the teacher.
O4	The process of learning mathematics in the classroom in instilling character values has been conveyed and its application is adjusted to activities while at home and monitored by the parents of each student. This is a challenge in instilling character values because you cannot control the attitudes of students with distance learning. While the characters instilled by the teacher in learning mathematics are self-confidence, responsibility, being able to calculate correctly, enthusiasm, courtesy, respect for elders, tolerance.
O5	Character planting in students integrates into the methods used by the teacher such as the discussion method with this method can instill characters such as cooperation, confidence when expressing opinions, and responsibility besides choosing media and strategies that can support the delivery of the desired character values and use media that are attractive to students. The character values instilled in students include discipline, self-confidence, courtesy, and care.

Gadgets as a medium in helping to follow the implementation of learning even most students do not have and must use gadgets from their parents or siblings. Factors like this are problems experienced by schools in learning activities. Teacher control of students becomes obstructed and it is difficult to measure students’ cognitive, affective, or psychomotor assessments. Even though learning activities are influenced by factors that come from within and outside themselves [16]. Online learning means external factors that affect student activity in the learning process. Moreover, related to mathematics learning with the material stigma that is difficult to make the cultivation of character values not work according to the concepts that already exist in the lesson plan. The results of interviews with teachers regarding the obstacles experienced in

the process of planting character values in mathematics learning with the Covid-19 pandemic conditions are as follows.

TABLE 5: Results of interviews with teachers about the barriers to planting character values in mathematics learning.

T1	Barriers to character planting in integrative thematic mathematics learning are the majority assumption that mathematics is difficult, boring so that teachers must provide varied media and methods so that students do not think that mathematics is difficult. Especially with the condition of distance learning like now, it adds to the difficulty in understanding mathematics material, let alone to instill the character as desired.
T2	When the Covid-19 pandemic did not know what changes children experienced when learning mathematics, whether children could understand it or not and each child had a different character, which was given the character planting of not only one child but twenty-five children, and each one was implanted. characters how to catch and how to understand different characters.
T3	Cannot instill character values in online learning or directly because it is not face-to-face, but only limited to giving encouragement and support to students to learn even though mathematics is difficult but through being encouraged by the teacher, students are more confident and can get through it.
T4	The obstacles experienced by the teacher when instilling character in learning mathematics cannot be done instantly, it takes time and must be repeated.
T5	The lack of students in capturing the material being taught so that in solving the questions students are not thorough and cannot do the questions sequentially according to the steps to solve the questions besides the lack of creativity in making interesting media to make it easier for students to understand the material. Some of the assignments given to students are still done by their parents or siblings.

The results of observations also show that the learning process experiences various obstacles, including not all students having access to gadgets, only relying on gadgets owned by parents, poor internet network constraints, and not having internet packages to access learning. Whereas video is a medium for providing learning, teachers have difficulty in making, editing, and exploring learning materials by the Learning Implementation Plan that has been made both related to media, learning models, and completing tasks that must be done by students. The impact of learning like this is based on observations. what the researchers conducted showed that teachers and students were not ready to implement online learning models. Teachers who have a role in managing the class have not been able to maximize the students' understanding of the material. In addition to teachers who have not mastered technology optimally, managing classes online is a challenge that teachers must face in learning in the Covid-19 era.

The solution to the obstacles in planting the character values of the implementation of mathematics learning from the interview results is as follows.

Notes from teachers about learning mathematics online show the difficulties experienced during the learning process. Especially about instilling character values in the learning process of mathematics, it adds to the difficulties experienced. The ability of teachers is the key to making the online learning process attractive to students



TABLE 6: Results of interviews with teachers about solutions to instill character values.

T1	Teachers must be able to prove that mathematics is not a difficult subject, by choosing the right method. The teacher must be good at relating the material to the characters presented. The teacher must be an example for the desired character. By making class rules/agreements, giving awards.
T2	Solutions to overcome obstacles when instilling characters in integrative thematic mathematics learning, I hope this pandemic will be over quickly so that I know for real about the obstacles when planting mathematical characters, solutions for mathematics learning I try to make interesting videos so that children are interested in learning so that planting characteristics of integrated mathematics learning run according to its objectives
T3	Allow parents of students to guide their children at home because the best teachers at home are parents.
T4	Solutions to overcome obstacles when instilling characters in integrative thematic mathematics learning are by reminding children, and parents must also play a role in cultivating children's character at home to continue to monitor children.
T5	Teachers are more creative, such as making media to make it easier for students to understand the material, besides the learning model used must include character values that want to be instilled in students.

by developing teaching media, models, or strategies that are attractive and likable to students. This method must be supported by parents who are teachers at home to be able to supervise their children in participating in teaching and learning activities and doing assignments given by the teacher.

#### 4. Conclusion

The process of learning mathematics with an online system becomes an obstacle for teachers and students to get an understanding of the material. The identification of the inculcation of character values with online learning is also prepared by the teacher by making learning tools such as syllabus, lesson plans, worksheets, teaching materials, evaluations that integrate character values in them. The teacher also strives to instill character values in making instructional videos such as in the initial activities carried out by praying according to students' religious beliefs, core activities by observing student behavior in the learning process, discussion, and problem-solving in mathematics material, math problems, and discipline, responsibility, independence, honesty in completing mathematics assignments given to students. Learning using YouTube media for instructional videos and WhatsApp media for the discussion process and assignment collection is a new model of learning for teachers and students. Obstacles in the online learning process include not all students having access to gadgets, only relying on gadgets owned by parents, poor internet network constraints, and not having internet packages to access learning, teachers have not mastered technology optimally.

Managing classrooms online is a challenging teacher must face in learning in the Covid-19 era. So the planting of character values in mathematics learning is still limited by the teacher.

## Acknowledgments

This research was funded by Beginner Lecturer Research Grant from Institute of Research and Community Services Universitas PGRI Yogyakarta, Indonesia, number: 033/BAP-LPPM/PDP/I/2021.

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