Implementation of Mathematics Curriculum Management in Distance Learning in Private Junior High Schools

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Abstract. In the new normal education era, distance learning or face-to-face learning has psychological implications for students, including mathematics. This study, therefore, aims to find a conceptual model for implementing mathematics curriculum management in distance learning in Muhammadiyah private junior high schools in Yogyakarta City. This qualitative research used a descriptive approach, with data from ten Muhammadiyah private junior high schools in Yogyakarta City. The study results revealed that (1) the strategy for implementing mathematics curriculum management in distance learning was led directly by the principal in the form of a breakdown of regulations. (2) The learning carried out by the teachers was based on the plan they prepared at the beginning of the school year. (3) The success factor of the implementation carried out by the teachers was the selection of media and learning platforms. The teachers performed (4) Assessment in implementation at the end of each lesson. (5) The infrastructure for the learning implementation had been fulfilled. (6) The training provided to teachers had been programmed by the principal periodically. (7) Class formation was conducted to group students according to their interests and abilities. (8) The obstacle faced by the teachers was challenging to know the students' expressions during learning. Meanwhile, (9) constraints faced by students were networks and internet quotas owned, so it was not easy to understand the material presented by the teachers.

Keywords: Distance Learning, Implementation, Mathematics Curriculum, Muhammadiyah Junior High School, Curriculum Management

1 Introduction

Education is the entire process in which a person develops abilities, attitudes, and behavior, either from a structured and tiered path or not [1–3]. However, due to the COVID-19 pandemic, many things have been affected, including education, i.e., schools[4–7]. The pandemic also requires schools to have the ability to manage the learning process so that the quality of education is guaranteed. [8,9] explained that the government had made policies as stipulated in Government Regulation Number 21 of 2020 concerning Large-Scale Social Restrictions in the Context of Accelerating Handling of Corona Virus Disease 2019 (COVID-19).

Efforts to control and prevent COVID-19 transmission have been carried out by restricting interactions and crowds and maintaining physical distance from one another, including learning in schools [10–12]. In addition, the COVID-19 pandemic has forced learning patterns initially in the classroom to change to distance learning [13,14]. This distance learning implementation then significantly impacts exact subjects, such as

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mathematics, since students perceive mathematics as a complex subject [15–18]. In mathematics distance learning, there are also unresolved obstacles, including parents who have not been able to provide direct guidance to students, use of technology and networks that have not been maximized, and teachers who are not competent in utilizing technology [19,20].

For conditions during the COVID-19 pandemic that do not negatively impact the student learning process, efforts need to be made to increase student learning independence, one of which is the online learning application [21,22]. In line with that, the current development of information technology gives rise to various choices of learning platforms that can be utilized by teachers and students and dramatically affect students' understanding of learning [23–25].

Based on studies conducted [4,22,26] the COVID-19 pandemic has disrupted the conventional learning process, so solutions are required to overcome these problems, i.e., by finding the proper learning conceptual model. [27] also stated that with the conceptual model used, teachers could shape scientific behavior and social and spiritual attitudes and develop students' curiosity. Accordingly, research [28,29] found that most students coped well with distance learning challenges in 2020.

Moreover, with the conceptual model, teachers are expected to encourage effective mathematics distance learning implementation, thereby increasing student understanding and school quality. However, no previous research has specifically revealed a conceptual model of mathematics distance learning in private junior high schools in Yogyakarta City. For this reason, this study aims to find a conceptual model for implementing mathematics curriculum management in distance learning in Muhammadiyah private junior high schools in Yogyakarta City. Meanwhile, the urgency in this research is the improvement and development of research in the field of education, especially education management and educational technology, and the discovery of mathematics distance learning models as an alternative to solving problems in the implementation of mathematics distance learning.

2 Research Method

This study applied qualitative methods to explore facts empirically and objectively. Qualitative research is a process of understanding and interpreting the meaning of a person's interaction event, so it depends on their social environment [30]. The researchers also used an interpretive approach to explain with some consideration the background or experience undergone by someone with a predetermined subject [31,32]. In this research, ten stages were carried out: a preliminary study, literature stage, observation stage, focusing on research problems, data collection (interviews, observations, and documentation), data processing, data analysis, discussion (data authenticity), conceptual model discovery, conclusions, and suggestions.

In the preliminary stage, the researchers collected information from ten Muhammadiyah private junior high schools in Yogyakarta regarding distance learning problems, especially in mathematics lessons, and gathered various literacy on these problems. After the information and literacy required had been collected sufficiently, the researchers began to observe at the research site to determine the focus of the problem. The problem’s focus in this study was how a conceptual model of mathematics distance learning was applied in private junior high schools in Yogyakarta City, with the research subjects in this study consisting of ten private junior high schools in Yogyakarta City.

Data with an interpretive approach can be obtained through interviews, observations, and documentation studies [30,33]. In the interview process, the data obtained came from the principal, vice principal, mathematics teachers, and several students from each batch. Then,

the observation was made on the mathematics distance learning process utilizing zoom and google meet applications. At the same time, the documentation data were derived from the learning tools (planning) used by the teachers. The researchers then processed the data using Atlas based on the data collection method. ti 8 application to make it easier to code research. After all the specified codes existed, the researchers analyzed the data and evaluated the data validity using triangulation of sources, techniques, and time.

In the next stage, the researchers discussed the data from the analysis and found a conceptual model of mathematics distance learning at Muhammadiyah private junior high schools in Yogyakarta City. In the final stage, the researchers concluded from the findings and discussions and obtained nine results in implementing mathematics distance learning. The research stages can be seen as follows:

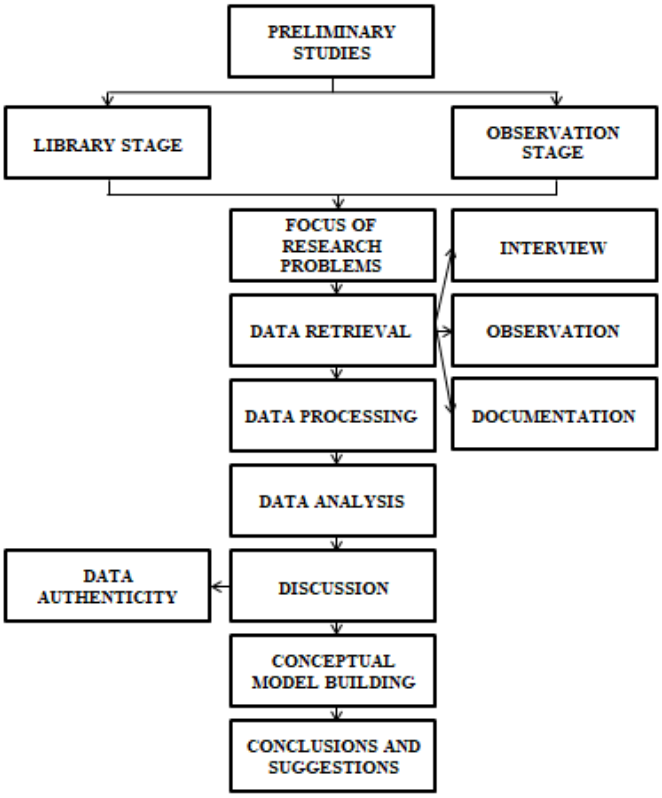

Figure 1 Research flow chart

3 Fidings and Discussion

From ten Muhammadiyah private junior high schools in Yogyakarta City, four crucial points regarding mathematics distance learning were found: strategy, implementation, support capacity, and obstacles encountered, which can be seen in Figure 2 below.

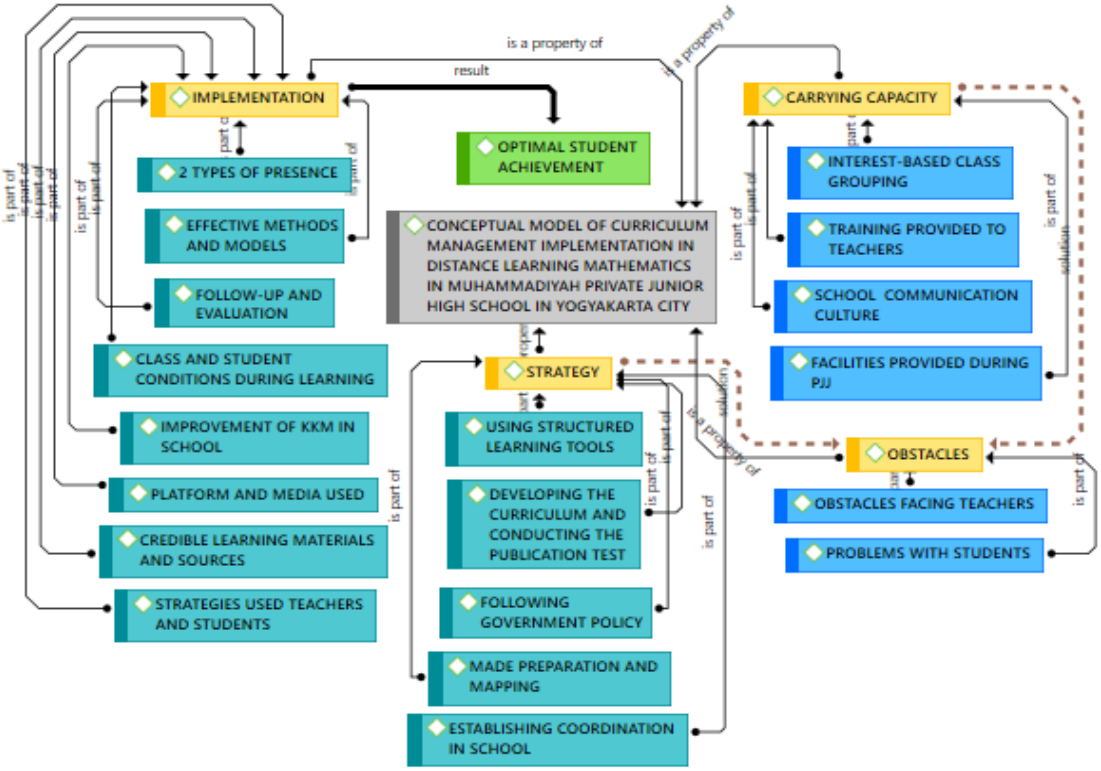

Figure. 2. Conceptual model of mathematics learning

3.1 Implementation

From the observation results in the field, it was found that the process of implementing mathematics distance learning in Muhammadiyah private junior high schools in Yogyakarta was based on the planning in the lesson plan. Based on the documentation conducted, the teacher documents, in general, fulfilled the 2013 curriculum components. In addition, the teacher's lesson plan became a reference during the learning process, which is evident from the smooth implementation of learning and ensuring that students did not lose education and learning during an emergency [12,34].

Meanwhile, for the selection of materials, the informants explained that they came from anywhere; moreover, with the development of technology, teachers can now utilize various media. The choice of learning models and media, such as zoom and google classroom used by teachers, can also increase student grades and achievement [12,35–37]. Besides, the minimum mastery criteria applied in schools during distance learning tended to increase from the previous one. It was due to the mature preparation made by the teachers, as evidenced by the observation of one of the mathematics teachers at the Muhammadiyah private junior high school in Yogyakarta. In this case, the minimum mastery criteria are a standard reference for teachers, students, and parents since they are part of the assessment planning that every teacher must carry out in the school [38,39].

Concerning students' psychological preparation at the beginning of learning, the teachers usually asked about students' situations and network conditions to participate in the

learning process and pray together. Despite distance learning, teachers strived to develop students' academics and create a sense of comfort for students while learning [40–42].

Furthermore, the teacher's strategy was to deal with student boredom during learning, utilizing various media and learning platforms, and providing opportunities for students to ask questions. One of the distance learning platforms used by teachers was Zoom [7,43]. In terms of communication, the teacher also created a forum, such as a WhatsApp group, to provide information to students and provide reports to parents about the progress, such as forming two types of attendance: counseling guidance teachers and homeroom teachers. In this respect, attendance is an obligation that must be fulfilled by students when studying remotely, either via a webcam, to integrate into the learning environment [7,44].

At the end of the lesson, the teacher gave an assessment or evaluation. It aimed to determine the extent of the students' knowledge after the teacher's material delivery. The teachers applied several types of assessment, such as giving daily assignments, tests, and others. Conducting an assessment here had a positive impact as an overall evaluation material in distance learning [7,12].

3.2 Strategy

The strategy for implementing mathematics curriculum management in distance learning differs in each school due to the diverse conditions of each school. The implementation of distance learning in schools also follows the rules made by the central and local governments, as did one Muhammadiyah private junior high school in Yogyakarta, which implemented policies from the Ministry of Education and Culture, Governor Regulations, City Education Office Regulations, and Foundation Regulations. In this case, during the COVID-19 pandemic, it is practical for academics, especially schools, to follow the advice of the government in providing a learning process for students, including curriculum preparation [12,45].

In addition, one of the resource persons said that the curriculum preparation was based on the curriculum development team at the school by adjusting the lesson matrix and teaching materials that had been prepared at the beginning of the semester. It agrees with what was stated [12,46] that in a pandemic, it is necessary to revise the curriculum and adapt to the conditions of each region. After the planning matrix, the teachers made learning tools consisting of semester programs, syllabi, and lesson plans, which became a reference so that the learning process could be carried out effectively. Moreover, the success of achieving learning objectives is determined by the ability of teachers to plan, implement, and assess a lesson [47–49].

Furthermore, teachers received distance curriculum change socialization to assess the curriculum publications prepared with representatives from the committee, all teachers and employees, and supervisors. However, the primary challenge in trying mathematics curriculum in distance learning was how to increase students' learning speed [35,40].

3.3 Support capacity

During the mathematics distance learning process, facilities are needed for learning to be conducted effectively, as provided by a Muhammadiyah private junior high school in Yogyakarta in giving infrastructure. The informant stated that it was due to the excellent communication culture built by the principal. The importance of communication culture is also one of the essential things in distance learning [50,51]. In addition, the support provided by the school was in the form of making learning videos for teachers, especially mathematics, by utilizing technological developments. Making learning videos given to teachers is also one

of the applications of technology, is considered a significant component of e-learning, and can develop teacher skills [52,53].

Another form of support provided by schools for mathematics teachers in mathematics distance learning at the Muhammadiyah private junior high school in Yogyakarta was training. Teachers received several types of training, such as from their respective schools and the MGMP, which aimed to improve teacher competence. It aligns with what was stated [41,54,55] that schools should train teachers to be more professional and motivated during the distance learning process. Research also reported that teachers could not utilize computer technology without knowledge of information technology [56–58].

Aside from the training provided to mathematics teachers during distance learning, one of the Muhammadiyah private junior high schools in Yogyakarta also created a program at all grade levels by establishing four types of classes: IT class, superior class, language class, and regular class. This class division also impacted students' mathematics lessons; for example, the ability of the special class in mathematics also differed from other classes, and the IT class, on average, learned better in using technology. The purpose of class formation [51,59] was so that students could focus on the interests they enjoy and improve the quality of a school.

3.4 Constraints

In general, the constraints faced by each school in implementing mathematics distance learning were almost the same due to the same regional conditions. In mathematics distance learning, many obstacles were met by both teachers and students.

From the results of observations made by researchers on learning guided by several resource persons, it was found that the obstacles encountered by the teacher included network and quota constraints, so the resource persons could not provide a summary at the end of the lesson. It is also consistent with previous research [50,51,60] explaining that students felt isolated and had difficulty getting feedback from teachers.

Moreover, the resource person admitted that the constraints encountered by teachers in the learning process were the difficulty of knowing and observing students' expressions because of the networking problem. Then, because of not knowing the condition of students when learning mathematics, the teachers did not know whether all students could follow the learning process; the resource person said that online learning could help children who skipped classes go unnoticed.

In addition to the problems encountered by teachers, students also experienced various problems. It comprised the difficulty of students adapting in the early days of mathematics distance learning. Besides, the most frequent obstacles that arose were that students had trouble learning face-to-face and the substantial number of quotas that must be spent during mathematics distance learning [51,61]. Students also tended to lack a dedicated study space at home and could not fully take advantage of previous learning opportunities [35,36,62,63]. The informant also stated that one of the solutions to anticipating students' problems during mathematics distance learning is to choose suitable media and learning platforms for students' conditions. Al-Related to that, [40] asserted that it is necessary to have a distinctive design to improve students' learning abilities in overcoming other difficulties during distance learning.

4 Conclusion and Acknowledgements

4.1 Conclusion

Based on the research findings and discussion, it can be concluded that (1) the strategy for implementing mathematics curriculum management in distance learning was led directly by the principal in the form of a breakdown of regulations. (2) The learning carried

out by the teachers was based on the plan they prepared at the beginning of the school year. (3) The success factor of the implementation conducted by the teachers was the selection of media and learning platforms. The teachers performed (4) Assessment in implementation at the end of each lesson. (5) The infrastructure for the learning implementation had been fulfilled. (6) The training provided to teachers had been programmed by the principal periodically. (7) Class formation was conducted to group students according to their interests and abilities. (8) The obstacle faced by the teachers was challenging to know the students' expressions during learning. Meanwhile, (9) constraints faced by students were networks and internet quotas owned, so it was not easy to understand the material presented by the teachers.

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