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TEACHING PROFILE OF MATHEMATICS TEACHERS ON CLASSROOM MANAGEMENT: A STUDY ON QUADRATIC EQUATIONS

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ABSTRACT

Pengelolaan kelas menjadi hal yang sangat penting dikuasai oleh guru dalam meningkatkan kualitas pembelajaran siswa di kelas. Namun, dalam penelitian terdahulu menyatakan bahwa guru belum optimal dalam mengelola kelas sehingga kualitas pembelajaran yang dihasilkan kurang maksimal. Oleh karena itu, penelitian ini bertujuan untuk mendeskripsikan profil pengajaran guru terhadap pengelolaan kelas matematika pada materi persamaan kuadrat, serta memberikan pedoman kepada guru dalam merancang model pembelajaran yang mampu memotivasi dan mendorong keterlibatan siswa dalam proses pembelajaran. Jenis penelitian yang digunakan adalah deskriptif dengan pendekatan kualitatif. Teknik pengumpulan data penelitian ini melalui observasi, wawancara, dan dokuementasi. Analisis data melibatkan pengumpulan data, kondensasi, penyajian data, dan penarikan kesimpulan. Hasil penelitian ini menunjukkan bahwa guru telah menerapkan pembelajaran yang berpusat pada siswa *(students-centered learning)* dan berhasil dalam mengelola kelas dengan baik. Guru mampu memberikan motivasi kepada siswa, meningkatkan antusiasme siswa, dan pemberian pertanyaan pancingan kepada siswa yang memberikan dampak positif. Hasil penelitian ini berkontribusi pada pemahaman tentang pengelolaan kelas matematika yang efektif dan dapat menjadi panduan bagi praktisi pembelajaran matematika dalam mengadopsi pendekatan yang berfokus pada siswa.

Classroom management is very important for teachers to master in improving the quality of student learning in the classroom. However, in previous studies, it was stated that teachers were not optimal in managing the class, so that the quality of learning produced was not optimal. Therefore, this study aims to describe the teacher's teaching profile of mathematics classroom management on quadratic equation material, as well as provide guidelines for teachers in designing learning models that are able to motivate and encourage student involvement in the learning process. The type of research used was descriptive study with a qualitative approach. The data collection techniques were through observation, interview, and documentation. Data analysis involves data collection, condensation, data presentation, and conclusion drawing. The results of this study show that teachers have implemented student-centered learning and succeeded in managing the class well. Teachers are able to motivate students, increase students' enthusiasm, and provide stimulating questions to students that have a positive impact. The results of this

study contribute to the understanding of effective mathematics classroom management and can serve as a guide for mathematics learning practitioners in adopting student-centered approaches.

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1. INTRODUCTION

The role of teachers in education is critical because the knowledge they impart can lead to positive changes in shaping a smarter future generation. High-quality teaching competence can develop students' higher-order thinking skills (Ningrum et al., 2022). Therefore, it is essential to have professional teachers who continuously enhance their roles and competencies to create effective learning environments. In the classroom, a teacher's primary activities include teaching and managing or organizing the class (Husnul & Retnawati, 2017). Teaching involves all efforts to help students achieve learning objectives, while classroom management relates to creating and maintaining an environment conducive to effective learning throughout the teaching process.

Mathematics is considered a fundamental science in education. However, many students still perceive mathematics as a difficult subject, leading to a lack of motivation to learn it (Putri et al., 2021). Additionally, students often view mathematics as a daunting subject (Apriyani, 2017). This perception is influenced by the teacher's role; if mathematics is taught engagingly, it can become enjoyable. Therefore, in addition to mastering the subject matter, teachers must employ appropriate strategies in their teaching. The selection of suitable strategies can help mathematics teachers create productive learning experiences, increase student engagement, and enhance the effectiveness of the instruction.

Classroom management is a crucial factor in the learning process, necessary for creating an optimal learning environment. Effective classroom management significantly impacts the quality of the learning process (Kurni & Susanto, 2018). Conversely, a teacher's inability to manage the classroom correlates with the failure to achieve learning objectives. Classroom management involves understanding, diagnosing, and making decisions to improve the classroom atmosphere (Harahap et al., 2023). Djabba (2014) defines classroom management as creating an environment where students can learn effectively. Meanwhile, Manullang (2014) states that managing a mathematics classroom involves planning, organizing, implementing, and evaluating the learning process. Given mathematics' abstract, logical, and systematic nature, appropriate methods and strategies are needed to create an enjoyable learning atmosphere. Consequently, if mathematics teachers manage their classrooms well, students will find the subject more enjoyable.

One strategy teachers can use to make mathematics classes more enjoyable is the use of instructional media. Instructional media are tools or resources that help students understand the material (Arumsari, 2017). They serve as aids in the learning process, making it easier for teachers to convey knowledge and material to students (Sapriyah, 2019). From these perspectives, instructional media are tools that support the learning process, aiding students in grasping the material. The appropriate use of instructional media by teachers enhances the effectiveness and efficiency of teaching and learning, leading to better classroom management and the achievement of learning objectives.

However, several studies indicate that many teachers have not yet optimized their classroom management skills. Observations by Maharani et al. (2021) show that teachers' ability to manage classrooms is not yet optimal. Similarly, Suhandi & Alirmansyah (2020) report that teachers struggle with classroom management aspects such as seating arrangements and creating a comfortable learning environment, which results in students feeling bored during lessons. Additionally, Renanda et al. (2023) found that poor classroom management by teachers negatively impacts students' mathematics learning outcomes.

Effective classroom management is particularly important for teaching quadratic equations, as many students struggle with this topic due to a lack of understanding of mathematical concepts and language. Quadratic equations require students to comprehend coefficients, variables, and constants (Anggraini & Kartini, 2020). Therefore, good classroom management by teachers can create an effective and optimal learning environment, enabling students to master quadratic equations properly.

Many studies have examined classroom management, highlighting its importance in creating conducive learning environments that make teachers' guidance clear and effective (Kalaka, 2021). Effective classroom management minimizes disciplinary issues, leading to optimal learning (Wahid et al., 2018). Teachers must master curriculum, teaching methods, and subject matter, as well as possess strong classroom management skills to create an active, creative, effective, and enjoyable learning environment. Parnata et al. (2023) report that classroom conditions significantly impact the learning process; a non-conducive environment can frustrate teachers, making the classroom atmosphere tense and the learning process less enjoyable.

Despite the attention classroom management in mathematics education has received from scholars (Cahyani et al., 2019; van Dijk et al., 2019; Tacadena, 2021; Youngs et al., 2022; Zhou et al., 2023; Barahona et al., 2023), there is still a lack of research on the profile of mathematics teachers' classroom management, especially concerning quadratic equations. This study aims to fill this gap by focusing on the profile of teachers in managing mathematics classrooms for quadratic equations. The findings will provide a reference for understanding mathematics teachers' classroom management and guide teachers in designing approaches that motivate and engage students in the learning process.

2. METHODS

This research adopts a descriptive design with a qualitative approach. The aim of qualitative research is to comprehend and investigate the meanings that individuals or groups assign to social issues (Creswell & Creswell, 2023). The primary focus of this study

is to offer a factual portrayal of a mathematics teacher's methods in managing classroom activities, specifically in the context of teaching quadratic equations.

1.1. Research Subject

The study involved a mathematics teacher, referred to as KK, from 9th grade at SMPN 1 Bululawang in Malang Regency, East Java, and the students of class 9F, which included 21 female students and 11 male students. Class 9F was chosen for this study due to its superior performance compared to other classes. KK has been teaching since 2002 and holds a Bachelor's degree in Mathematics Education from the State University of Malang. Additionally, KK has completed the Teacher Professional Education and Training (PLPG) program and obtained a teaching certification. KK is also actively engaged in various professional development activities, such as the Teacher Leadership Program, educational training, and workshops.

KK identified several challenges in teaching mathematics, such as students' inadequate foundational knowledge, low motivation towards the subject, and distractions caused by mobile phones. To mitigate these issues, KK employs educational media to enhance student engagement in mathematics. This approach is consistent with Hasan et al. (2021), who assert that educational media facilitate the transmission of information from teachers to students, thereby stimulating students' interest in learning. Educational media serve as tools to present information more clearly, accurately, and engagingly.

In managing the classroom, KK often uses a technique involving the formation of homogeneous groups for mathematics instruction. According to KK, homogeneous groups foster responsibility among students for their assigned tasks, whereas heterogeneous groups may lead to dependence of less active students on their more active peers.

KK also underscores the necessity of assigning tasks to students to motivate them to study mathematics at home. These tasks are reviewed collectively in subsequent lessons. Through the combination of task assignments and discussion activities, it is anticipated that students will become more motivated and active participants in mathematics learning.

1.2. Data Collection

Data collection in this study used three techniques, namely observation, interviews, and documentation. These techniques were chosen by the researcher to obtain factual and authentic information according to the conditions in the field.

Observation in this study included two components, namely the observer and the object being observed. The object of observation was a mathematics teacher with the initials KK. The researcher conducted direct observation on Monday, September 25, 2023, at SMPN 1 Bululawang, specifically in class 9F while KK was teaching. This observation covered KK's strategies in teaching quadratic equations, classroom management skills, classroom conditions during the lesson, and students' responses throughout the learning process.

Interviews in this study aimed to obtain more in-depth information about the subject's profile and classroom management by the subject. The researcher used semi-structured interview techniques with key questions listed on the interview guide sheet.

Interviews were conducted with KK and two 9F students, consisting of one male student and one female student selected randomly based on teacher recommendations. The topics for the teacher included educational background, teaching experience, challenges faced in teaching, preparation before teaching, and teaching techniques. Meanwhile, the topics for students were related to their views on KK's teaching in class.

The main instrument in this study was the researcher, while supporting instruments included validation sheets and interview guide sheets. These supporting instruments were validated by an expert with a doctoral degree in mathematics education and ten years of teaching experience.

Documentation was carried out during observation and interviews. During observation, the researcher took pictures, videos, and noted important things. During the interview, the researcher took photos and recorded audio. This documentation was done to support the results of observations and interviews, in line with Sugiyono (2013) who stated that research results from observations and interviews would be more credible if accompanied by documentation.

1.3. Data Analysis

In analyzing the collected data, the researcher refers to the steps of qualitative data analysis according to Miles et al. (2020), namely: (1) data collection, (2) data condensation, (3) data display, and (4) conclusion drawing. The data analysis process in this study includes:

1. Data Collection
   At this stage, the researcher collects raw data obtained through observations, interviews, and documentation that have been conducted. The collected data, including photos, videos, important notes, and audio recordings of interviews, are stored in Google Drive.
2. Data Condensation
   After the data is collected, the researcher proceeds to the data condensation stage. In this stage, the researcher selects and organizes the observation and interview data that is relevant to the research topic, which focuses on the profile of mathematics teachers' teaching in terms of classroom management skills. Videos and recordings that do not relate to the research topic are not included in the data analysis. The results of the data selection, simplification, and focusing process are presented as key points of the research findings.
3. Data Display
   At this stage, the observation, interview, and documentation data that have been condensed are presented in the results and discussion section. The data presentation is done in a narrative description supported by documentary images and excerpts from interview transcripts.
4. Conclusion Drawing
   At this stage, the researcher draws conclusions that have been tested and verified regarding the profile of mathematics teachers' teaching in terms of classroom management skills on the topic of quadratic equations.

3. RESULTS AND DISCUSSION

3.1. Results

In this study, a variety of observation instruments and tools were employed to comprehensively collect data. The researcher adopted an observational method involving multiple data collection techniques. One such technique involved conducting descriptive interviews with the supervising teacher identified as KK, and randomly selected students. Through these interviews, the researcher sought to gain insights into their perspectives and experiences related to the research topic. Additionally, video recording devices were used to capture activities within the observation environment, while audio recorders documented conversations and important sounds that may not be visually apparent. Field notes also served as crucial instruments in detailing the observed situations. Through the combination of these tools, the researcher could gather comprehensive and in-depth data for research analysis.

Figure 1. The teacher begins the lesson by directing the students to pray

In the initial phase, KK prepares the class by creating a conducive atmosphere, followed by a prayer, as depicted in Figure 1. During the prayer, if any student arrives late, KK requests them to wait outside until the prayer concludes. Afterward, KK takes attendance. During this process, if any student disrupts the class atmosphere, KK addresses and reminds them about decorum. Following this, KK outlines the day's learning objectives to provide students with a clear understanding of what they will be studying. KK also briefly introduces prior knowledge, connecting the lesson to students' experiences or existing knowledge, thereby preparing them to explore new concepts. Through these steps, KK establishes a conducive learning environment and motivates students to engage enthusiastically.

In the core instructional phase, KK directs and guides learning using virtual reality (VR) games on Android devices, as shown in Figure 2. These VR games ensure that learning remains engaging and interactive, preventing students from feeling bored or overly restless during explanations. Upon completing the games, KK forms small groups and distributes Learner Worksheets (LW) as instructional aids. KK encourages student participation by allowing questions and actively engaging them. Figure 3 illustrates KK

providing necessary assistance to students facing difficulties with the LKPD, utilizing scaffolding techniques to aid their understanding of the material. KK tactfully redirects students who are distracted or discussing unrelated topics. Additionally, KK responds attentively to students' questions, explaining concepts clearly and informatively, thereby ensuring students feel listened to and understood throughout the learning process.

Figure 2. The students use Android VR games

Figure 3. Teacher Guides Students in Completing LW

In the closing section, as seen in Figure 4, KK instructs students to consider class assignments as homework. After giving these instructions, KK proceeds with a reflection session, encouraging students to critically evaluate what they have learned, identify concepts that may still be incompletely understood, and consider how the material can be applied in daily life. KK concludes the lesson with a closing greeting.

Figure 4. The teacher conducts reflection

Based on an interview with KK, he has had a highly impressive teaching experience since 2002 to the present. KK graduated from Universitas Negeri Malang with a background in mathematics education and has been certified as a teacher. KK also attended PLPG training, which required a test before participating in the training. One of KK's best experiences was as a teacher trainer. According to KK, "I happen to be a teacher trainer and often attend training, such as today's VR Android games learning, also from training." However, like many other mathematics teachers, KK faces challenges in teaching, especially regarding the lack of basic mathematics understanding among some students. KK noted that "Students often struggle to understand the basics of mathematics, thus facing difficulties in understanding more advanced-level materials." To address this, KK uses teaching methods that encourage active student participation, such as forming work groups and giving in-depth assignments.

KK is also very attentive to diverse learning styles among students and always strives to facilitate group learning. Before each lesson, KK prepares a detailed Lesson Implementation Plan (RPP). Additionally, KK encourages students to create projects based on the material, such as spatial structure projects, to enhance student creativity. KK not only assigns project tasks but also conducts daily quizzes after each chapter. All student activities, including notes, are appreciated by KK. With this comprehensive teaching approach, KK has made a valuable contribution to improving students' understanding and motivation in learning mathematics.

From interviews with students, a very positive picture emerges of KK's abilities in various aspects of teaching. Students acknowledge that KK has a strong grasp of the subject matter and can explain difficult concepts in an easily understandable manner. KK is also known for maintaining classroom discipline by actively involving students in the learning process. KK's responses to student questions are also considered good and patient.

Nevertheless, students identify two areas for improvement. Firstly, KK is perceived to provide insufficient real-life examples or illustrations that help students better understand the material. Using concrete examples can clarify the relationship between the

material and everyday life. Secondly, students feel there is a need for greater variety in teaching methods and higher motivation from KK, especially regarding the application of material in everyday contexts.

Observations show that KK has a good ability to manage the mathematics class. KK can create a conducive learning environment, maintain student discipline, and implement effective teaching methods. KK has also successfully used VR Android games to motivate students to actively participate in learning mathematics. However, KK needs to increase motivation regarding the application of material in everyday life. KK also provides additional support to students experiencing difficulties, while classroom time management remains effective. Overall, these observations provide a positive overview of KK's ability to create a productive and efficient learning environment.

3.2. Discussion

The difficulty students face in learning mathematics is a common challenge in the field of education. Research indicates that students often struggle with solving problems on Worksheets for Student Participants (LKPD), especially in understanding definitions, applying concepts, and converting story problems into mathematical sentences (Yusmin, 2017). One effective approach to address these difficulties is to create a conducive, efficient, and engaging classroom environment for students.

A conducive and efficient classroom environment heavily relies on the teacher's ability to manage the class. An effective teacher can create an environment that motivates students, stimulates curiosity, and minimizes distractions that hinder the learning process. The role of the teacher in creating a supportive learning environment for the development of students' mathematical skills is crucial (Yanti, 2015). By managing the classroom effectively, teachers can facilitate efficient and effective teaching and learning activities.

The use of virtual reality (VR) games on the Android platform is an effective method to enhance mathematics learning, particularly in spatial skills development (Indriani, 2020). VR technology offers an interactive and engaging learning experience that can boost student motivation and participation in learning. VR's ability to create environments close to real-life situations also helps students better understand the material.

Scaffolding, as a method tailored to students' abilities, is an effective approach to helping students better understand mathematical concepts and increasing their motivation (Retnodari et al., 2015; Cipta et al., 2020). By providing appropriate assistance, teachers can enhance students' confidence in tackling difficult tasks, creating a learning environment that supports exploration and better achievement.

The success of teachers in managing mathematics classrooms significantly impacts students' ability to learn mathematics. Effective classroom management, as described by Sumar (2020), includes designing, organizing, monitoring, and evaluating classes, which helps teachers facilitate students who need assistance, motivate them, and choose learning methods that meet individual needs. By integrating these factors, teachers can create a learning environment that supports students' overall understanding and achievement in mathematics.

4. CONCLUSION

This study describes teachers' classroom management practices for grade 9F students at SMPN 1 Bululawang using Android-based VR (Virtual Reality) games in mathematics education. The use of this media aims to create an engaging and enjoyable learning experience for students. The research findings indicate that teachers employ a student-centered learning approach, where their roles include setting learning objectives, motivating students, and fostering engagement through probing questions to enhance interactive learning. Additionally, teachers provide scaffolding when students require assistance in problem-solving. The teaching and classroom management by teachers are considered optimal, with a deep understanding of students' learning styles and efforts to facilitate their individual needs. To create a more conducive learning environment, it is crucial to maintain and enhance these established practices.

As a recommendation for future research, it is suggested to conduct further studies on the effectiveness of classroom management in mathematics education, particularly utilizing Android-based game learning media or manipulative tools, with a focus on enhancing student motivation.

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