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Pedagogical Reflection in the Mathematics Learning Process During the Teaching Assistance Program at SMAN 7 Kediri

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Abstract: *Teaching Assistance activities at SMAN 7 Kediri provide valuable experience for university students from non-educational study programs to directly understand the learning process at school. Through this activity, university students not only play the role of delivering material, but also learn to build effective communication, understand student character, and adjust learning strategies so that the learning process becomes more meaningful. During the implementation of Teaching Assistance, university students face various challenges, such as differences in students' ability to understand mathematical concepts, fear of asking questions, the influence of lesson schedules on learning focus, and distraction problems due to students being allowed to bring and use mobile phones in class. These challenges encourage university students to conduct continuous pedagogical reflection to assess the effectiveness of learning methods and adapt them to real conditions in the classroom. Through pedagogical reflection, university students realize the importance of changing the approach from being teacher-centered to student-centered. The implementation of participatory and collaborative learning strategies has been proven to increase student involvement, foster confidence, and strengthen critical and logical thinking skills. In addition, Teaching Assistance activities also teach important values such as empathy, patience, responsibility, and adaptability to classroom dynamics. Overall, this experience broadened the insight of university students of non-educational study programs about the world of learning and fostered awareness that teaching is not just about delivering material, but also helps develop students' character and potential.*

Keywords: Teaching Assistance, Pedagogical Reflection, Mathematics Learning

1. INTRODUCTION

Education is one of the main pillars in shaping quality Human Resources (HR) in a country [1]. Through education, a person not only gains academic knowledge, but also various social, moral, and emotional skills that are the foundation for building a superior and civilized society. The better the quality of education, the superior the human resources produced, and vice versa [2]. Quality education will give birth to a generation that is adaptive, able to think critically, and able to contribute to national development, so that improving the quality of education is a strategic step in producing superior human resources who are ready to compete at the national and global levels [3].

University students have a strategic role in society, one of which is as agents of change. Through various service and off-campus learning programs, university students can make a real contribution to becoming a bridge between the academic world and the needs of the community [4]. The involvement of university students in the world of education, especially in the school environment, can be a new color that is expected to bring innovation in the learning process, strengthen student learning motivation, and help educators in implementing more adaptive and contextual learning methods [5].

One of the tangible manifestations of the role of university students in improving the quality of education is through the Teaching Assistance program which is one of the Merdeka Belajar-Kampus Merdeka (MBKM) programs launched by the Ministry of Education, Culture, Research, and Technology. The Teaching Assistance Program provides opportunities for university students, including from non-educational study programs, to contribute to the world of education in Indonesia. The involvement of university students of non-educational study programs in Teaching Assistance activities is a challenge in itself to apply analytical skills in a direct pedagogical context. In practice, university students are not only required to master the teaching materials, but also manage classes, interact with students, and create a conducive and meaningful learning atmosphere. The biggest challenges often arise in subjects that students consider difficult, such as mathematics [6].

Mathematics subjects often cause learning anxiety for some students. This condition requires the ability to think logically and creatively from university students so that the delivery of material can be well received and become a fun learning. University students from non-educational study programs have the potential to bring a new perspective to mathematics teaching, namely by applying analytical skills and mathematical logic into pedagogical contexts. This kind of approach can help students understand that mathematics is not just a collection of numbers and formulas, but rather a language of logic that is systematic and has an important role in various aspects of life [7].

From the learning process that has been carried out, there is a need to reflect on the experience more deeply. In this

context, pedagogical reflection is an important component during the Teaching Assistance process because reflection is not only a means of evaluation, but also as an in-depth learning to understand the roles, challenges, and strategies in teaching activities for university students of Teaching Assistance. Through pedagogical reflection, university students can review their teaching experience, assess the effectiveness of learning, and analyze student responses during the learning process [8]. On the other hand, reflection on teaching activities can also foster awareness of the importance of a humanistic approach in the world of education. University students not only see students as individuals who receive information, but also individuals who have different uniqueness, potential, learning styles, and backgrounds [9]. Thus, pedagogical reflection becomes a learning space that brings together academic, social, moral, and emotional dimensions in a balanced manner [10].

Through involvement in the Teaching Assistance program, university students have the opportunity to see the world of education from a broader perspective. This experience is not only about delivering the subject matter, but also about interacting with various student characters, understanding the dynamics of life at school, and learning to cultivate empathy and patience in education. The reflection from this experience confirms that teaching is not just a process of knowledge transfer, but a journey to cultivate human values, appreciate differences, and build meaningful relationships between university students as teachers and students. Thus, Teaching Assistance activities become a learning space that brings together knowledge, experience, and human values in a complete unit.

2. RESEARCH METHODS

The approach used in this study is qualitative descriptive, with the aim of describing pedagogical experiences during the implementation of Teaching Assistance activities in high school. Through this approach, the dynamics of mathematics learning are seen from the perspective of university students of non-educational study programs who are directly involved in the classroom. The analysis was carried out thematically, by tracing various teaching experiences, then elaborating them into conclusions and interpretations that describe the learning process and reflection during the activity [11].

The research activity was carried out at SMAN 7 Kediri, from August 11 to October 20, 2025. During this period, activities were focused on the role of university students as assistant teachers of mathematics subjects in several classes with direct guidance from the pamong teacher. University students are involved in the learning process, starting from helping to plan learning activities, accompanying students, to reflecting after teaching activities. To gain a more comprehensive understanding, three data collection methods were used in accordance with the characteristics of qualitative research, namely direct observation, visual documentation, and pedagogical reflection. These three methods complement each other in providing a complete picture of the mathematics learning process as well as the reflective experience gained during the implementation of Teaching Assistance.

2.1 Direct Observations

Direct observation is a method of collecting data by conducting direct observations in the field. This method is carried out to obtain a real picture of the dynamics of mathematics learning in high school students during Teaching Assistance activities. Through this method, university students can observe directly how the interaction process between students and teachers or university students teaching assistants takes place in the classroom. The main focus of observation includes material delivery strategies, student responses to learning, students' understanding of the assignments given, and how university students can adapt to the school environment. Direct observation in the context of education plays an important role in understanding pedagogical phenomena in real terms, as it allows university students to understand real behaviors that are sometimes not revealed from data collection through other methods, such as interviews, written documents, and others [12].

During the observation, university students can witness and record various situations that are relevant in teaching practices, such as how to build communication, approaches in helping to solve learning difficulties experienced by students, to the dynamics of collaboration between parties in the classroom. In this case, observation is carried out in a participatory manner, namely when university students make direct observations and are involved in learning activities [13]. This observation can expand university students' understanding of the learning context because it allows for direct reflection and evaluation of the role performed.

2.2 Visual Dokumentation

Visual documentation is used as a complement to observation data, which can be in the form of photos, screenshots, videos, or other supporting documents. This method plays an important role in strengthening the empirical evidence of the learning process that takes place in the classroom. The existence of visual documentation can be used to provide validation of the findings of observation. On the other hand, documentation also functions to support the pedagogical reflection process by presenting a visual picture of the activity, so that it can be an evaluation material for teaching activities. For example, through visual documentation, it can be observed again the position of the teacher when explaining the material, the expression of students during learning, and the nonverbal interaction that occurs between the teacher and the student.

2.3 Pedagogical Reflection

Pedagogical reflection is the main goal of this research, which is as a means for university students to study and re-analyze the teaching experience that has been implemented. Reflection is very important to improve the professionalism of teachers, especially in the context of pedagogic competence

development, including the direct and objective teaching process. The reflection process is not only carried out once at the end of the research, but must be carried out continuously, either through diaries, discussions with teachers, and personal evaluation of the teaching methods that have been applied. Priadi (2025), also stated that daily pedagogical reflection can help university students identify difficulties and weaknesses in learning, assess learning outcomes and implementation, and align learning methods and media with student needs [14].

Reflection activities are also an important means in developing critical, logical, and creative thinking skills to solve pedagogical obstacles faced. Through reflection, university students can assess the effectiveness of the methods applied and find more suitable methods to improve students' understanding of the material taught. Pedagogical reflection not only serves as a self-evaluation, but also as an effort to improve and develop pedagogical skills on an ongoing basis. Thus, reflection becomes a bridge between practical experience in the field and the development of professional competencies in classroom learning [15].

3. Results and Discussion

The implementation of the Teaching Assistance Program at SMAN 7 Kediri provides meaningful experience in understanding the dynamics of mathematics learning from the perspective of university students of non-educational study programs. During the implementation period, university students not only play the role of teachers in teaching in the classroom, but also as learners who reflect on teaching practices critically. Through direct observation methods, visual documentation, and pedagogical reflection, various findings emerge providing an overview of how pedagogical theory is applied in real learning in the classroom.

3.1 Pedagogical Experience During the Learning Process

During the Teaching Assistance activities, university students gain valuable experience in understanding the mathematics learning process at the high school level directly. This experience not only covers the technical aspects of how the delivery of material in mathematics subjects is carried out, but also the social dynamics, psychological and emotional aspects that arise in the classroom. Based on the results of direct observation, it can be seen that the classroom atmosphere is greatly influenced by the teaching strategies applied and the way teachers interact with students.

At the initial meeting of the Teaching Assistance activity, the teaching strategy that university students apply is to explain the material directly in the first hour, and discuss the questions directly without giving students time to work on the next hour. It turns out that this strategy is not suitable because students are less active in responding to the next question and become dependent on the teacher. This teaching strategy also makes students only look at the teacher without wanting to think deeply about how the systematic cause and effect of a formula is applied.

In the next meeting, the author tried another strategy, namely by explaining the material directly in the first 50 minutes, giving 15 minutes to work on three to four questions, and the rest of the students who managed to work on the questions went forward and explained. However, this strategy also does not produce optimal results, because students are still passive and point to other students who are considered smart to move forward. This incident certainly did not match what university students expected even though there was a slight increase in focus from students.

Based on direct teaching and the results of reflection carried out after learning by asking directly to students in class, there are still many students who think mathematics is a lesson that is difficult to understand, boring, and sometimes some answer scary. This kind of thinking still often appears, so that students only resign themselves and are afraid to ask questions if they do not understand the material or cannot solve mathematical problems. It is undeniable, the mental condition of each individual is different. Students who are only resigned and afraid to ask questions if they can't usually because they are afraid of being judged or ridiculed by their peers if the answer is wrong.

Seeing these conditions, university students then tried to change the learning method to be more participatory and collaborative. If in the previous learning meetings, university students divided their time to explain the material almost half the time of the mathematics subject, then for the next meeting the explanation session was only made short. When explaining the material, it is also interspersed with triggering questions that encourage students to think critically, such as "how can this formula apply?" or "what if the numbers are changed, will the result remain the same?". This kind of spark question aims to make students not only passively accept mathematical formulas and concepts, but also understand the logic behind each step of completion.

After the explanation session was over, university students gave several questions to the students. Working on the questions can be done by discussing with classmates and other closest classmates. The questions given are in the form of HOTS (High Order Thinking Skills) type questions from examples of college entrance exam questions from previous years. This step is carried out with the aim that students are used to facing problems with a higher level of difficulty and are able to develop critical, analytical, logical, and creative thinking skills in solving a problem. During the discussion process, university students went around observing the course of cooperation between students, giving encouragement to those who seemed confused, and helping to explain concepts that were not yet understood in a simple way. This approach not only makes the classroom atmosphere livelier, but also builds a two-way interaction between teachers and students.

The implementation of this strategy shows a positive change in the classroom atmosphere. Students who were initially passive began to show interest in learning, even most of them seemed more enthusiastic about trying to answer

questions and scrambling to work in front of the class. University students also noted an increase in logical thinking skills and a deeper understanding of concepts because students not only memorized formulas, but also understood their application in a real context. Reflection on this change in methods provides a new understanding that in mathematics learning, the role of teachers is not just a conveyor of information, but a facilitator who helps students find their own knowledge. Through active interaction, learning becomes more meaningful because students are directly involved in the process of thinking, discussing, and solving problems. Thus, learning that was originally teacher-centered slowly turned into student-centered learning, which encouraged the birth of independence, curiosity, and intellectual courage in learning mathematics.

3.2 Challenges and Dynamics in Mathematics Learning

The implementation of Teaching Assistance at SMAN 7 Kediri cannot be separated from various challenges that affect the mathematics learning process. One of the main challenges is the difference in students' ability to understand mathematical concepts. This cannot be separated from the fact that each individual has advantages in their respective fields. In math learning, some students quickly grasp concepts, while others require more detailed but simple explanations. This requires teachers to adjust learning strategies flexibly so that all students can understand the material well.

In addition, class dynamics are also influenced by psychological, social, and lesson schedule factors. Based on the observations made, classes with mathematics lesson hours in the middle of the day, around 09.00 to 11.30, tend to be more focused and responsive compared to classes that get a schedule of mathematics subjects at the beginning or end of the day. Classes that are too early sometimes make students still sleepy, while classes in the afternoon to evening show a decrease in energy and concentration. The results of the observation showed that students' concentration and participation were influenced by biological rhythms and daily schedules, so that the arrangement of lesson schedules was one of the important factors in learning effectiveness.

Another challenge that arises is the fear of students to ask questions if they do not understand the material. Many students are passive because they are afraid of being judged or ridiculed by their peers if the answers given are wrong, so that the student becomes a timid individual to ask or answer questions. To overcome this, it is necessary to carry out strategies to encourage courage and active participation from students, for example by providing opportunities for discussions, visiting students who seem to be having difficulty working, and guiding individual problem work.

In addition to the challenges related to the material, the conditions of the learning environment in the classroom also affect the effectiveness of learning. At SMAN 7 Kediri, students are allowed to bring mobile phones without the obligation to collect them at the beginning of lessons. This causes students to be easily distracted, especially when there are notifications or the use of gadgets secretly during learning. This situation makes only some students really focus on following the learning process, while others seem to pay less attention to the teacher's explanation and the material presented. This challenge is an important aspect that university students must consider in conducting pedagogical reflection during the Teaching Assistance program.

In addition to internal factors from students, lesson time management is also a challenge in itself. In one meeting session, university students teaching assistants must balance between delivering material and practicing questions. Sometimes, you also have to adjust to Free Nutritious Food (MBG) meal hours which sometimes cut study hours. Therefore, effective time management is needed so that students stay focused, have time to think critically, work on problems in front of the class and discuss them, as well as a brief reflection at the end of learning. This dynamic emphasizes that the learning process is not only related to academic aspects, but also teachers' skills in managing classes, interacting socially, and adapting teaching methods to the needs of students.

3.3 Pedagogical Reflection and Teaching Competency Development

Pedagogical reflection is the main tool for university students who participate in Teaching Assistance to develop teaching competencies in an ongoing manner. Through reflection, university students can assess the effectiveness of learning strategies, find strengths in delivering material, and evaluate interactions with students. This process is not only carried out after the Teaching Assistance activities end, but can be done per day on an ongoing basis through daily notes, discussions with teachers, and evaluation of the teaching methods carried out.

The results of reflection show that a change in learning strategy is needed, namely the original teacher-centered become student-centered. This change in learning strategies has a significant impact on participatory engagement, concept understanding, and the development of students' critical thinking skills. University students teaching assistants also learn to be facilitators who can guide students in solving problems, not just conveying information. These changes have a positive impact on student participation and a livelier classroom atmosphere. Through the reflection process, university students realize the importance of a balance between delivering concepts and providing students with space to think independently.

The experience in this Teaching Assistance activity has a positive impact on university students, namely improving their ability to manage classes, observing group dynamics, and developing adaptive strategies according to student needs. University students also realize that teaching is not a static activity, but a dynamic activity that requires continuous adjustment. The success of the teaching and learning process

is not only determined by how much material is delivered, but also by the extent to which students can be actively involved and understand the meaning of the learning.

Collaboration with teachers is also very important as a form of professional learning. Through discussions and feedback provided by the teachers, university students gain new insights on how to deal with various situations in the classroom. Reflection that is carried out consistently helps university students form a mature pedagogic identity, namely awareness of educator responsibility, empathy for students, and commitment to continue to improve teaching practices in the future.

3.4 Implications of Pedagogical Reflection on the Teaching and Learning Process

Pedagogical reflection in Teaching Assistance activities has valuable implications for university students, especially for those from outside the field of education. Through direct involvement in the classroom, university students can understand how learning dynamics are formed, how to interact with students, and how to strategize to deliver material to make it easier to understand. This experience also fosters communication skills, empathy, and social sensitivity that are not only beneficial in the world of education, but also in various other fields of work.

The continuous reflection process helps university students realize the importance of being adaptive and flexible in dealing with various situations. When faced with differences in student character, limited study time, or differences in students' ability to understand material, university students will learn to think critically and find practical solutions. From this, leadership skills, decision-making, and patience in dealing with various conditions in the field also grow.

Thus, the implications of pedagogical reflection are not only on teaching ability, but also on the formation of the character and professionalism of university students teaching assistants. Through this experience, university students of non-educational study programs can broaden their perspective on the teaching and learning process, understand the challenges that exist in schools, and apply this reflective attitude in various situations in daily life and the world of work.

4. Conclusion

Teaching Assistance activities at SMAN 7 Kediri are a valuable experience that opens up new views on the world of education, especially for university students who come from non-educational study programs. Through direct involvement in the classroom, university students realize that teaching is not only about delivering material, but also about understanding students' character, building good two-way communication, and adjusting learning strategies to make them more meaningful. During the teaching process, there are many challenges faced. Starting from differences in students' abilities, their fear of asking questions, to the influence of lesson schedules on learning focus. In addition, the policy of allowing students to bring mobile phones without collecting them is an environmental distraction that must be managed by teachers. However, through reflection and strategy adjustment, university students realize that learning will be much more effective when students are given space to think, discuss, and discover their own understanding. A student-centered approach has been proven to make the classroom atmosphere livelier and encourage their activeness in learning math. From this experience, university students not only gain insight into the teaching process, but also learn important values such as patience, empathy, and responsibility. Pedagogical reflection helps university students see each challenge as an opportunity to grow and improve. This Teaching Assistance activity is proof that anyone, even if they come from a non-educational study program, can still contribute to the world of education as long as they have the willingness to learn and sensitivity to students.

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