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7 Integrate of Moral Values of Mathematics

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ABSTRACT

This research aims to analyze the need to develop a particular mathematics teacher training model. The qualitative methods were used with a focus on evaluating the implementation of teacher training held. Data were collected using a questionnaire containing four aspects of the training, i.e., materials, instructors, methods and processes, general knowledge about moral values in mathematics, and interviews. The data was obtained from questionnaires given to subjects, the mathematics teachers having more than five years of experience. The results show that: 1) the training materials are relevant to learning mathematics in schools, 2) instructors have a significant role in the success of training, 3) the methods of mathematics teachers training that have been held so far have not used a particular model of mathematics training, and 4) the training process that takes place involves trainees and instructors only as facilitators. In addition, it was also found that in learning mathematics, there are moral values that can shape students' moral character to support affective and cognitive development. So that mathematics teacher training can be developed into a moral-based training model using four moral components: moral sensitivity, moral judgment, moral motivation, and moral character.

Keywords: *Training, teacher, mathematics, moral.*

1. INTRODUCTION

Education needs to be addressed in building the order of life and shaping the mindset of an advanced society. Education is an effort that is constantly changing for the better. The government, researchers, education practitioners, and teachers continue to work together in designing the curriculum. To implement the objectives of the applicable curriculum, the teacher becomes the main actor who controls the success of students in the learning process. Therefore, a teacher code of ethics law is enacted, which requires teachers to continue to develop their professional competence through organized training and education.

Many programs have been organized by the government and those who care about education, such as professional teacher education in collaboration with the best universities in Indonesia, various kinds of training, such as subject teacher consultations, and other development training by educational quality assurance institutions. Overall, they have the same goal, namely to

develop the potential and improve the competence of teachers.

The curriculum implemented in Indonesia is to integrate Pancasila values and uphold the norms that apply in society. Thus, it is clear that teachers need to have adequate knowledge regarding the character, or in this study called morals, so that teachers not only teach the field of mathematics but also integrate morals in the process. However, before applying it in the classroom, the teacher must have sufficient knowledge about optimizing and balancing morals and mathematics. Therefore, the researcher conducted a study to know the extent of the teacher professional development program in the form of training held.

Based on the curriculum that applies in Indonesia, which applies the values of Pancasila, which have a moral character in learning in schools, as education practitioners in mathematics, we need to find all kinds of ways so that moral concepts are not lost even in teaching mathematics. This is where mathematics education and morals together support each other to form the generation needed by the nation. In essence, the purpose of

mathematics is "connection and interpretation" that someone who studies mathematics must be able to understand phenomena outside of mathematics to be brought into mathematics and then modeled mathematically and connect values outside mathematics with mathematical ideas or vice versa [1].

It is important to note that number sequences and mathematical problems are not the only main ones in learning mathematics. What if we take an idea outside of mathematics to optimize mathematical performance. This will be useful in collaborating mathematics scores and non-mathematical grades in a more tangible way. So that, to understand the purpose of learning mathematics is very important to formulate a model or process of solving mathematical problems [2]

The problem that is always a concern in education is how to shape students into individuals who can be useful and superior, both in the academic field and in society. Educators are expected to assist students in learning something and developing their knowledge, personality, and talents. Even though it seems that the task of educators is quite simple to do, namely delivering teaching materials, evaluating processes and results, the fundamental essence that needs to be realized lies in the values that are implicitly present in the learning process.

Before focusing on learning mathematics, it's good to understand the various competencies needed to become a competent educator. Teaching is a moral activity associated with moral value, and moral itself is an ability that can distinguish the value of right or wrong. So that one important aspect that is implicit is moral. Therefore teaching is a moral activity in society that should not be ignored [3] in the substance of any teaching material.

Based on the background above, this study aims to obtain data on the extent to which teacher competency development activities have been carried out by various educational quality assurance institutions and the government to improve the quality of teachers, especially teachers in the field of mathematics studies.

12. LITERATURE REVIEW

2.1. Values of Learning Mathematics

Learning mathematics is not just thinking about numbers or solving a mathematical problem, but many values or benefits can be taken from learning mathematics. Talking about learning mathematics, the National Council of Mathematics has set standards in learning school mathematics. Namely, students must have the ability to solve problems, do reasoning and prove their reasoning, communicate mathematical ideas verbally and non-verbally, and represent mathematical problems [1], [4]. In addition, the standard content of school mathematics material from elementary to high school levels has been set, divided into numbers and

operations, measurements, geometry, algebra, data analysis, and probability. This research is focused on the upper secondary level so that the materials that meet are geometry, algebra, data analysis, and probability.

2.2. Moral Education

In essence, teaching or educating is a moral act that reflects the moral character of educators in building a good learning situation or climate in the classroom. Educators as role models become the main goal in developing moral values for students. Although the moral seems complicated if associated with the cognitive domain, it does not mean it is impossible to relate. The moral is knowledge to judge something right or wrong, as well as how to behave according to ethics and apply ethical principles based on established and applicable values [5-7]. Therefore, education has become a moral effort that establishes educators as the party responsible for the moral development of their students [3], [8].

2.3. Moral Pancasila

Pancasila is the formulation and guideline for the life of the nation and state for all Indonesian people. The existence of a nation is largely determined by the majority-owned by the younger generation. It will only become a dignified and respected nation by other nations if it has strong morals. Therefore, to become a moral nation, it is necessary to still the values of the nation's moral tradition to the younger generation so that they can face various problems and global competition.

The values contained in pancasila, which are expected to be realized in learning, are behaviours that radiate a sense of love and nationality and love for the homeland in mastering, applying, and developing science, technology, and art with a full sense of responsibility and morals. So that education in pancasila is interpreted as an intellectual act full of responsibility that emphasizes professional competence for students who graduate from their respective fields. Morals in pancasila are related to norms and values, namely containing the integrity and personal dignity of a person bound by the teachings, regulations, attitudes, and behaviour of a person both in writing and orally about how a person must live and act to become a good person [9]. Consequently, pancasila ethics obliges every Indonesian citizen to act following the norms that have been established and contained in the pancasila precepts.

2.4. Mathematics Teacher Development Program

Training or training for teachers is a solution provided by the government to empower and improve teachers' quality. Previous studies investigated the effect of the competencies possessed by teachers with the training that

had been held, and the results were significantly influential [10], [11]. Training is a learning process devoted to teachers so that an appropriate learning model is needed to achieve the objectives of the training.

3. RESEARCH METHOD

¹¹ This study is qualitative research that aims to overview the development of mathematics teacher training models that various institutions have held. The data obtained from the questionnaire and made based on aspects of the training include (1) training materials, (2) instructor characteristics, (3) training methods, and (4) training process. And then the data related to the training model and its aspects. The subjects of this study were mathematics teachers who had participated in various kinds of self-development training in learning mathematics. A total of 50 respondents were taken to fill out a questionnaire related to the evaluation of teacher training, followed along with the training model used in training. The selected respondents are teachers who have more than five years of teaching mathematics experience.

4. RESULT AND DISCUSSION

This research is based on the need for the professionalism of mathematics teachers so that some aspects assessed consist of training materials, instructor abilities, training methods and training processes, and knowledge of teacher morality.

4.1. Training Material

The indicators of training materials are (a) the relevance of the material to learning mathematics in the classroom, (b) the need for teacher professional development, (c) the need for the teaching profession, and (d) the pattern of mathematics training. In organizing a training, it should be noted that the material included in the material needed by the teacher and can be used and applied in the teacher's and students' learning rooms in the classroom after the teacher returns from training. The results show an increase in teacher confidence in understanding and communicating the material delivered in training.

The use of simple language is more emphasized in the communication aspect so that it has implications for students' understanding of the material taught. In in-depth interviews with respondents, the trainees generally felt a very big impact after attending teacher training, one of which was that they enriched and developed more personality and social concepts while learning mathematics. Therefore, based on the results obtained, 94.4% agreed that the material presented in teacher-trained learning was relevant to what is taught in mathematics class. In other words, the mathematics

material presented in training follows the applicable curriculum. In addition, after attending teacher training, the respondents acknowledged an increase in mastery of the material, which was more profound and more focused on managing to learn.

In addition, respondents stated that the mathematical problems given were related to reality. As trainees, they were allowed to solve problems in groups or individually and then given time to discuss proving the results of solving mathematical problems. This is important for teachers to understand and apply in the classroom with their students later.

4.2. Instructor Ability

The indicators of the instructor's ability are teaching skills, communication skills, emotional stability, social skills, and skills in using training media. So far, the teachers who have attended various training are satisfied with the professional skills of the instructors. Mastery of the material and managing the classroom climate can make them feel comfortable while learning. In interviews, respondents revealed that a good instructor is when we trainees start to get bored with the class atmosphere, but he starts thinking about breaking up the atmosphere to make it fun again. So, the instructor needs to have excellent emotional stability.

4.3. Training Model

In general, the training carried out so far has been conducted traditionally without special methods or models. This was acknowledged by all respondents who stated that the learning process was only based on discussion, question, and answer or doing math problems. This is interesting when it has been emphasized that there is a connection between learning mathematics and personal social values in the first aspect.

4.4. Training Process

¹⁰ In the aspect of the training process, the teachers who have attended the training admit that not a few of them apply what they have learned during the training even though the material presented is relevant. For teachers, the formation of student attitudes will determine the success of student learning. Students having good character usually have more intelligence than their other friends. What is conveyed by the teachers in the class is a reflection of themselves so that they will place themselves as a student, and at the same time, he will place himself as a teacher who is needed. This is because the curriculum applied in Indonesia emphasizes teaching mathematics without ignoring students' moral values and character.

4.5. Integration of Moral Values in Mathematics Learning

The characters as outlined in the curriculum are based on the moral values of Pancasila. So, we can conclude that it is necessary to design a special training model for mathematics teachers related to morals. Based on the interviews with several mathematics teachers at the secondary school level, it was found that in general, the training so far has been good, but the topics were too general. For example, teacher training in all fields of study not only for mathematics or training and deliberation for mathematics teachers without using a special model.

The core of morality concerns how the relationship between humans. If examined further, conflicts between races, religions, nations, or fellow human beings are caused by moral problems. Four components of morality conceptualizing the capacities needed for effective moral are: (a) moral sensitivity (situation interpretation), (b) moral judgment (judging which the right or wrong of an act), (c) moral motivation (values that guide individual's behavior), and (d) moral character (skills implementation). The following are the components, dimensions, and moral indicators based on Kant's thinking and adapted to the concept of Pancasila values integrated into teacher training.

4.5.1. Moral Components

4.5.1.1 Moral Sensitivity

Moral sensitivity is an interpretation of the situation about the action performed and the effect that action has on ourselves and others. This process involves a cognitive and affective process. Cognitive processes include; perception, judgment, and interpretation, and affective arousal includes; anger, apathy, anxiety, empathy, and disgust contribute to the interpretation of problematic situations

4.5.1.2. Moral Judgment

The first schema associated with adult moral thinking is self-interest schemes, namely decisions motivated by self-interest, fear of authority, and lack of independence or a sense of personal responsibility. The second is maintaining norms, focusing on strengthening existing norms, rules, codes, and laws. The third is the post-conventional scheme centered on the concepts of justice, honesty, obligation, and the evolutionary nature of morality in society and the profession.

4.5.1.3 Moral Motivation

Moral motivation and commitment involve prioritizing moral values over other personal values. People will be motivated to take action only because they are at stake or in a risky condition and must be responsible.

4.5.1.4. Moral Character

Moral character is the skill that determines the strength of your convictions, determines courage, persistence, overcoming distractions and obstacles, determines the skills of execution, and determines the strength of the ego. A person may have sensitivity to moral values, but if he lacks skills, his mind will be distracted since he is in a state of exhaustion or unable to endure. When implementing an action plan, professional technical skills, problem-solving, interpersonal skills, and character tendencies must be combined. The importance of self-regulation is that when we are faced with a problem and consider it a "fun" thing, we can be sure that we can work hard to solve the problem. Unlike when the problem is faced with fear and anxiety, the less likely it is to solve the problem. Feelings of apathy and cynicism will arise in everyone if the problems are faced beyond expectations or have no effective solutions.

4.5.2. The Relation of Moral and Mathematics in Classroom

The moral concept is a fundamental essence in education and supports this teacher training development research. One of the mathematics learning processes involving a moral component, based on interviews with mathematics teachers, is during the problem-solving process. In the problem-solving process, students and teachers work together in interpreting the problems encountered where the teacher facilitates students by providing scaffolding or giving directions to students about what to do. Then students individually or in groups begin to start the process of moral consideration known as the reasoning process. And another component that stands out is moral motivation, namely how the teacher understands students about the relationship between mathematics problems and everyday life. Then, students can consciously apply it by starting by discussing empathy, sympathy, and good social relations with others.

AUTHORS' CONTRIBUTIONS

Furthermore, the author will develop a special model of moral-based mathematics teacher training based on the analysis of this study.

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