Exploration towards attitude of students in elementary school teacher education in mathematics learning

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Abstract: The purpose of this paper is to know attitude of students of elementary school teacher education towards mathematics learning. The method used in this study is a qualitative approach. The sample is taken using cluster random sampling from second and fourth semester students of elementary school teacher education. Instrument used in this research is questionnaire. The results of the research show that the attitude of elementary school teacher education student at Universitas Sarjanawiyata Tamansiswa towards learning mathematics in the very high category.

1. Introduction
Mathematics is a basic science that plays an important role in the development of science and technology [1–3]. The rapid development of science and information technology has a positive impact on the development of information in education [4]. The development of highly advanced technology in the modern era and globalization also allows various activities to be carried out quickly and efficiently. Formal, informal and non-formal education can use information technology to access all knowledge [5]. This means that technology becomes an integral part of the learning experience and an important consideration for teachers, from the onset of preparing learning experiences through to teaching and learning with students [6]. Realizing the importance of the role of mathematics in various aspects of life, mathematics has become one of the objects studied at the level of elementary school, junior high school, senior high school, and higher education.

Mathematics learning in schools is a pattern and relationship tracking activity [7]. The implications of this view of learning mathematics are: (1) giving students the opportunity to carry out discovery activities and investigate patterns to determine relationships; (2) provide opportunities for students to do various ways; (3) encourage students to find the order, difference, comparison, grouping, etc; (4) encourage students to draw conclusions in general; (5) help students understand and find a connection between understanding one another. As revealed that: "Teaching cannot be defined effort from learning. Teaching is guiding and facilitating learning, enabling the leaner to learn, setting the conditions for learning. Your understanding of how the learner learns will determine your philosophy of education, your teaching style, your approach, methods, and classroom technology" [8]. It can be concluded that learning is an environmental arrangement that gives nuance so that learning programs grow and develop optimally.

Instruction is the process you use to provide students with the conditions that help them achieve the learning targets [9]. Learning is a process used to direct students to conditions that help them achieve their learning goals. Some learning goals are cognitive consisting of intellectual knowledge and thinking skills, affective means that students' feelings or perceived value of students, and psychomotor
consists of skills and physical responses. The purpose of school mathematics is for students to have the ability: understand mathematical concepts, use reasoning on patterns and traits, solve problems, communicate ideas, and have an attitude of appreciating mathematical uses in life [7]. Based on the objectives of mathematics learning, the abilities students must possess in mathematics learning include having an attitude of appreciating the usefulness of mathematics, namely attitudes toward mathematics learning.

The success of mathematics learning cannot be separated from various factors that influence it. These factors include factors that originate from students themselves, student environmental factors, material factors, and teacher factors. One of the factors that play an important role is the factor that originates from students who are usually called student characteristics. Characteristics of students in learning include: motivation, attitude, interest, talent, level of intelligence, etc. Each factor characteristic of students has their respective roles and are interconnected which then becomes one of the determinants of student learning achievement. These factors are related to students as learners, peers, instructional practices and classroom or school environment, the present study use these theoretical foundations to build an understanding of the various factors influencing students’ attitude towards learning mathematics [10]. Beside that the three similar parameters in the participants’ positions on and attitudes towards mathematics are: difficulty in mathematics studies, mathematics as a factor affecting future success and importance of mathematics as leverage for success according to the participants’ parents [11]. The attitude of students towards mathematics is one part of the characteristics of students that cannot be ignored in mathematics learning. Theoretically, students’ attitudes toward mathematics can influence mathematics learning achievement.

Mathematics learning and capability to achieve good grades in mathematics examinations was not only attributed to some unique talent, great effort or good discipline from an individual, but also to favourable attitudes and interest in mathematics [12]. Students’ attitude towards mathematics is affected by factors such as parental influences, teacher affective support and classroom instruction [13]. The building of problem solving competences in Mathematics is hindered by attitudes. Attitude is concerned with an individual’s way of thinking, acting and behaving [14]. Negative and positive attitudes are formed throughout the learning experiences students undergo. Attitudes have a serious influence on students, teachers, social groups that relate to individual students and the entire system at school. Attitudes are formed as a result of several learning experiences. Attitudes can also be formed simply by following the example or opinions of parents, teachers, and friends. Changes or imitations of attitudes can also be formed from learning situations. In this case, students imitate the nature of the teacher to shape their attitude.

Basically attitudes towards mathematics are positive or negative emotional feelings towards mathematics [15]. Individual attitudes toward mathematics are complex ways of emotions related to mathematics, mathematical beliefs, including positive and negative attitudes, and how students behave towards mathematics [16]. Attitude is a characteristic of someone who describes their positive and negative feelings towards an object, situation, institution, person or certain idea [9]. Attitudes are one of the affective characteristics that greatly determine one's success in the learning process [17]. A person’s mathematical disposition related to her or his beliefs about and attitude towards mathematics may be as important as content knowledge for making informed decisions in terms of willingness to use this knowledge in everyday life [18]. Therefore attitude is one of the affective characteristics that greatly determines one's success in the learning process.

Attitudes are affective behaviors consisting of five levels, namely (1) receiving, where students begin to pay attention to a phenomenon, (2) responding, students begin to feel the presence of the phenomenon, (3) valuing, students start interacting with phenomena, (4) organization, students begin to conceptualize behavior and feelings about phenomena, and (5) characterization, students develop a consistent philosophy about the phenomenon [19]. Attitude is the intensity of positive or negative influences associated with psychological objects. Psychological objects such as symbols, expressions, slogans, people, institutions, ideals, or ideas for different people regarding the influence of positive or negative things [20]. Attitude may be conceptually as a tendency towards a positive response or negative response to objects, situations, concepts, certain people, so attitude is influenced by cognitive
components (beliefs or knowledge), affective (emotions, motivations), and performance (habits or tendency to behave) [21].

Based on observations during the learning of Lower Class Elementary Mathematics courses most students have not prepared textbooks or notebooks when learning begins, students do not prepare the material to be learned during learning, students rarely ask lecturers and speakers, pay less attention during mathematics learning, and some students did not work on assignments and cheated during midterm exams and semester exams [22]. Then the results of quizzes, midterm, and final examinations semester of students have the same error, it is possible that it happened because they cheated. In the process of learning mathematics there are goals to be achieved, one of which is students appreciate the usefulness of mathematics, one of which has a positive attitude towards students. Attitude is the tendency to respond dynamically to either positive or negative towards an object, situation, institution, someone or certain idea that is influenced by cognitive components (beliefs or knowledge), affective (emotions, motivation), and performance (habits or tendency to behave). Based on the description above, it is necessary to explore the attitudes of elementary school teacher education students towards mathematics learning.

2. Method
This study uses a qualitative approach in the hope that it can reveal more carefully the student attitudes towards mathematics learning. The purpose of choosing this type of research is to find out directly and in more detail about attaining the attitudes of elementary school teacher education students towards mathematics learning. In addition, further analysis of the factors that influence the attitudes of elementary school teacher education students towards mathematics learning also needs to be studied more deeply so that educators can provide further information in formulating further learning strategies.

The study was conducted at the elementary school teacher education departement, Universitas Sarjanawiyata Tamansiswa. The subjects of this study were elementary school teacher education students in 2th and 4th semester of the elementary school teacher education study program at Universitas Sarjanawiyata Tamansiswa in the subjects of lower grade mathematics and elementary mathematics learning problems.

Data collection methods used to obtain data are giving attitude questionnaires and interviews. This method is used to obtain data regarding the positive attitude of elementary school teacher education students at Universitas Sarjanawiyata Tamansiswa. Attitude questionnaires were given to six other classes, namely 3 semester 2 classes namely 2A class as many as 27 students, 2C classes as many as 37 students, and 2H classes as many as 35 students and 3 4th semester classes, namely 4C classes as many as 50 students, 4J classes as many as 37 students 4K as many as 32 students. Data analysis techniques were carried out descriptively.

3. Result and Discussion
The study were in the form of quantitative data in the form of questionnaire results. Results score data will later describe the achievement of positive attitudes of students who will be included in the category of high, medium, or low. Data from interviews combined with the results of student work will provide a more in-depth picture of students' understanding, mindset and positive attitude towards mathematics learning. The attitude questionnaire scores obtained can be described as table 1.

| Class          | N  | Mean | Std. Dev | Minimum | Maximum |
|----------------|----|------|----------|---------|---------|
| 2th semester   | 99 | 130,55 | 13,33    | 86      | 165     |
| 4th semester   | 119| 130,14 | 11,07    | 94      | 163     |

Based on table 1, it can be seen that the lowest and highest attitude scores in semester 2 are 85 and 165 with an average of 130.55. In the fourth semester the lowest and highest attitudes scores were 94 and 163 with an average of 130.14. Data on student attitudes obtained from the questionnaire were
then grouped into 5 categories based on the mean and standard deviation. A summary of the analysis is presented in the following table 2.

| Score Interval (X) | Category | 2th semester | 4th semester |
|--------------------|----------|--------------|--------------|
| 105 < X ≤ 140      | Very high| 97           | 117          |
| 93 < X ≤ 105       | High     | 2            | 2            |
| 58 < X ≤ 93        | Middle   | 0            | 0            |
| 35 < X ≤ 58        | Low      | 0            | 0            |
| 0≤ X ≤ 35          | Very low | 0            | 0            |

Based on table 2, it can be seen that in 2th semester there were 97 students who had attitudes in the very high category, 2 students had attitudes in the high category. For 4th semester there are 117 students who have attitudes in the very high category, 2 students have attitudes in the high category.

The object of the positive attitude of the students studied consisted of 3 objects, namely mathematics learning, lecturers, and learning resources. In the second grade of elementary school Mathematics subject learning in 2th semester, the average results of the questionnaire positive attitude towards mathematics learning is 113.5; the average result of the positive attitude questionnaire towards lecturers is 127.94; and the average questionnaire results of a positive attitude towards learning resources are 119.61. In the fourth semester elementary school Mathematics Learning Problems, the average results of the questionnaire positive attitudes towards mathematics learning are 145.18; the average positive attitude questionnaire results towards lecturers is 153.06; and the average questionnaire results of a positive attitude towards learning resources are 143.86. Based on this matter in elementary school mathematics class under semester 2, the lowest average is the average questionnaire results of positive attitudes towards learning resources, while in subjects in elementary school 4th grade mathematics learning problems, the lowest average is the average questionnaire results positive attitude towards mathematics learning. This is according to students should pay attention and to maintain positive attitudes to improve their language proficiency so that they will get better achievements [23], [24].

Furthermore, after conducting interviews, students explained that the learning done was presenting a problem and the answer to the problem, then students were asked to analyze the wrong answers and find solutions to problems, then determine the method, the media that fits the mathematical concept. Students explained that the accuracy in the class is very active in the discussion, even those who are active in the class are not merely wanting to get additional value, but also because of their awareness when they don't know or don't understand, students will ask during the discussion. If students have good attitudes about learning math, they will be more likely to understand the concepts which will help them develop confidence in their ability to work mathematical operations [25].

Preparation made by students is to learn the concepts that will be learned during learning. Students use various references including elementary school mathematics books, journals, internet articles, and even students diligently go to the library to get the references they will present. Based on the results of interviews with students regarding the assignments given by the lecturers it is very clear, then the lecturers also provide a learning atmosphere that activates students. This is according to sporting context can have positive impacts on students’ attitudes towards learning mathematics [26]. Weaknesses during learning are complex material so students must try more when understanding more complicated concepts. Based on interviews with students, it was found that students were happy when learning was done with various learning approaches such as problem solving learning. Attitudes are deeply related to motivation and social support, we believe that developing strategies in educational contexts, to improve teacher support and student engagement could be of vital importance in improving not only attitudes but also mathematical performance among students throughout their schooling [27]. Therefore the maximum effort should be given to improve the students’ attitude
towards mathematics and conduct further studies to find factors influencing students’ attitude towards mathematics [28].

4. Conclusion
Based on the results, it was obtained in the form of questionnaire scores on student attitudes towards mathematics learning. In semester 2 there were 97 students who had attitudes in the very high category, 2 students had attitudes in the high category. In semester 4 there were 117 students who had attitudes in the very high category, 2 students had attitudes in the high category. Suggestions that can be conveyed are lecturers should apply learning approaches, strategies, and creative and innovative learning models to be able to develop positive attitudes of students towards mathematics learning and develop a set of learning tools based on positive attitudes of students towards mathematics learning.

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