Making mathematics classes more humanistic

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Abstract. Humanistic mathematics class is a class that can make each student learn mathematics enthusiastically. Such classes respect individual differences and pay attention to students' psychology in learning mathematics, such as motivation, math-anxiety, and belief toward mathematics. Such classes underline the students' human aspects to be considered in the learning process, such as students' mind, hearts, feelings, and emotions. Such classes are needed to create a harmonious relationship between teacher-students and students. This harmonious relationship has the potential to help each student achieve their optimal achievement. From the study of several references it can be concluded that to make mathematics classes more humanist, the teachers need to: (1) motivating the students by demonstrating the usefulness or beauty of mathematics at the beginning of learning; (2) do not start learning by providing definitions or formulas; (3) controlling their emotion and full of enthusiasm throughout the lesson; (4) giving fair attention to all students; (5) giving a respect for every student's learning progress; and (6) making varied learning activities, including discussion, singing, poetry reading, watching videos or outdoor activities such as playing games, doing mini research, or buying and selling in shops/markets.

1. Introduction
Many factors influence the student learning outcomes of mathematics. Psychologically, learning motivation, math-anxiety, and belief in mathematics are three of the important factors that influence student learning outcomes. These three factors must be of concern to mathematics teachers.

Motivation is an urge to do something. Motivation is an important factor in learning. Many research results showed the effect of motivation on student learning outcomes [1 – 5].

Besides motivation, anxiety about mathematics (usually abbreviated as math-anxiety) is also an important factor that influences student learning outcomes. Students who are anxious about mathematics will tend to avoid mathematics and are reluctant to deal with everything related to mathematics. Math-anxiety, if it is still within reasonable limits can be a motivation. However, if it is excessive it will surely cause serious disturbances that have a negative impact on student learning outcomes. The results of a meta-analysis of Ma [6] on 26 studies concluded that there is a negative correlation between math-anxiety and student learning outcomes.

Other psychological factors that need attention from mathematics teachers are students' beliefs about mathematics. According to Schoenfeld [7] belief about mathematics is an individual's understanding and feelings that shape the individual's perspective on mathematics and how he is involved in mathematical behavior. Students' belief influences how he/she tries and acts. If the student has a strong belief that mathematics is very useful, mathematics can be learned, for example, then
He/she will tend to be persistent in learning mathematics. Thus, making the students have positive beliefs about mathematics is one of the tasks of the mathematics teacher.

The question that needs to be answered is "what kind of mathematics learning can increase student learning motivation, reduce students' anxiety about mathematics, and at the same time can strengthen students' beliefs about mathematics?" Through a number of studies temporary answers were obtained that mathematics learning with a humanist approach can theoretically increase student motivation, reduce student anxiety towards mathematics, and at the same time can strengthen students' belief in mathematics.

This article will explain: (1) what is called the humanist approach; and (2) how to implement a humanist approach to mathematics learning. With this study, it is expected that the results of a more humanistic mathematical learning model are obtained.

2. Methods
This article is the result of a theoretical review and study of several relevant research results. From a number of related articles that have been chosen, answers are formulated for the questions as mentioned above.

3. Result and discussion
3.1. Humanist Approach
The humanistic approach to education in principle is an approach that is based on a more holistic and humanistic perspective on students [8]. This approach underlines the importance of the students' human aspects to be considered in the learning process. There are students' mind, hearts, feelings, and emotions that cannot be ignored by the teacher during learning activities.

The idea of a humanist approach to learning according to Thakur [9] was initially introduced by Maslow, Sartre, Schiller, Schulz, Erickson, Roger, etc. According to Moskovitz [cited in 8], in principle, education must be related to two dimensions, namely intellectual and emotional. Therefore, students' feelings must be recognized and empowered by the teacher to achieve the learning goals.

Classes must also be conducive to student learning. Therefore, the teacher-student and student relationships must be sought as harmoniously as possible so that students are comfortable in attending the lesson. The teacher plays a role in creating a harmonious relationship between teacher-student and students in the class. According to Hughes & Kwok [10] the quality of teacher-student relations has a positive effect on student learning motivation and its involvement in classroom learning activities.

In order to create a harmonious relationship, the teacher must recognize students and their character well. The teacher must also be able to design learning activities that allow students to interact and learn from each other eagerly. According to Morganett [11], there are several things that can make a harmonious relationship between students and teachers. These things are: (1) Get to know students one by one, both names and things that are personal like hobbies; (2) Invite students to discuss the event/topic that is being discussed; (3) Appreciate each student's opinion; (4) Do not be unfair; (5) always enthusiastic in teaching; (6) Create a pleasant classroom atmosphere. Gablinske's research results [12] reinforce the importance of healthy and harmonious relationships between teacher-students and students to improve student learning outcomes.

Many things can be expected to occur if a healthy and harmonious relationship is created between the teacher and students and between students and students. Students become not afraid of their teacher. Students dare to ask, both to their teacher and to other students. Students do not worry too much when taking lessons. Students feel comfortable in class. There are no students who mock and bully the other students.

The students need to feel comfortable in class so that they are not afraid of their teacher and dare to ask questions. Students who dare to ask usually have high curiosity. Students who feel known, cared for, and valued their opinions by their teachers are usually motivated to study harder. The results of increasing student learning motivation include increasing student achievement.
The problem that arises later is how to apply this humanist approach to mathematics learning? As is well known, there are still many students who are anxious about their mathematics lessons. Mathematical learning with a humanist approach is expected to make students more comfortable in the classroom.

3.2. Humanistic Mathematics Learning
Every student must learn mathematics at school even though he may not have logical-mathematical intelligence. The math teacher must understand that some students in his class may not like math. Not just limited to disliking, some students might be overly anxious about their mathematics lessons. If this is the case, the mathematics teacher must try to carry out learning in more a humanistic approach.

Mathematical learning carried out with a humanist approach is usually called Humanistic Mathematics Learning. Humanistic Mathematics Learning is a philosophy of teaching and learning mathematics that tries to explore the human side of mathematical thinking to guide students to discover the usefulness and beauty of mathematics [13]. The mathematics class taught by a humanist approach is called the humanistic mathematics class. Basically, the humanistic mathematics class is a class that can make each student learn mathematics enthusiastically because they understand the usefulness and beauty of mathematics.

What should a mathematics teacher do to make the mathematics class more humanistic? Cibulskaitė [14] has formulated 3 main instructions to implement humanistic mathematics learning. The three instructions are related to teaching methods, learning atmosphere, and selection of teaching materials. Regarding the teaching methods, learning activities must be designed by the teacher such that it enabled each student to learn with understanding. Learning activities are expected to also make each student learn from each other and work together. The teachers must build a learning atmosphere with mutual respect, trust, honesty, responsibility, sincerity, and enthusiasm. The teacher must also choose the context in the teaching material that can introduce students to humanitarian sides such as the need to be sensitive to existing social problems, be open to other people's opinions, be honest, responsible, and so on.

In order for students to learn mathematics with understanding, the teacher must understand how students build mathematical concepts in their minds. According to Skemp [15], students construct their mathematical concepts through the process of abstracting many examples and non-examples of the concept. Therefore it is not recommended to the math teacher to start learning by definition/formula. Starting mathematics learning by definition can result in reduced understanding of defined concepts. Starting learning mathematics by providing a formula can result in students just memorizing the formula. For some students, finding the formula at the beginning of the lesson can also make him lose the mood to study.

In order for students to get the opportunity to learn from each other and work together, teachers need to design discussion activities in mathematics learning. There are many benefits obtained by students with the discussion. One of them is increasing student understanding. NCTM [16] states that discussions can improve the quality of learning, motivate students, improve teacher understanding of students' ways of thinking, and shift teacher authority to student groups. Discussion can also be seen as a strategy that helps teachers to understand what students already know and what they still need to learn. Therefore, the teacher must listen carefully when students discuss each other.

Besides discussion, activities in learning mathematics can also be inserted by singing, poetry reading, watching videos or outdoor activities such as playing games, doing mini research, or buying and selling in shops/markets. These varied activities can bring excitement to students and create a healthy academic atmosphere. Therefore, math teachers need to try it.

The academic atmosphere that is built from healthy and harmonious relationships between student-teachers and student-student has the potential to foster mutual respect, mutual trust, mutual responsibility, and mutual enthusiasm. Such learning atmosphere has the potential to make students more motivated to learn without anxiety. To be able to obtain such an academic atmosphere, the
teacher must be able to control his emotions and always be enthusiastic throughout the lesson, giving fair attention to all students, and must always respect the opinions and results of student learning. Control of teacher emotions becomes an important aspect in reducing student math-anxiety [15].

Selection of the right context has the potential to increase student involvement in learning activities. Learning mathematics must take context more frequently in daily life. By taking more contexts in daily life, students increasingly understand the benefits of learning mathematics. Understanding the benefits of learning mathematics also has the potential to increase learning motivation.

In addition to choosing the right context, the selection of tasks and homework must also be considered by the teacher. The right assignments and homework can improve student understanding and can challenge students to learn more. Therefore, giving assignments and homework to students must be on time and on target. Given that there are still students who are overly anxious about mathematics, it is important for mathematics teachers not to overdo assignments and homework. Assignments and homework must be carefully chosen according to the intended purpose. Students’ assignments and homework must be corrected and assessed by the teacher. Students must obtain feedback and appreciation from the teacher for assignments or homework that has been completed. Such appreciation from the teacher can increase learning motivation and students’ confidence in their ability to learn mathematics.

However, teacher assignments not only: (1) make students learn with understanding; (2) choose teaching methods that allow students to learn from one another; (3) build harmonious interactions with students; and (4) choose the right context, assignments, and homework for students, but also do other things. Haglund [17] mentions several other teacher assignments that make mathematics learning more humanistic. Other things are: (1) Making students as inquirers; (2) Teaching students to solve mathematical problems in many ways; (3) Showing students the history or mathematical discovery; (4) Using a variety of valuation techniques; (5) Helping students develop an understanding and appreciation of some great mathematical ideas that have shaped history and culture; and (6) Helping students see the study of patterns, including aspects such as beauty and creativity.

This means that for mathematics learning to be called humanistic mathematics learning, the teacher must be able to treat students as human beings who can learn, can find something, can solve problems, be able to work together, and can appreciate the beauty and usefulness of mathematics [17]. Of course, such humanistic learning is not easy. Teachers must know the characteristics of their students well and prepare lesson plans carefully.

Noting the ability of students in terms of mutual learning and mutual cooperation, the teacher can give group assignments and design discussion activities for students. Noting the ability of students to find something, the teacher should provide mathematics not entirely in the form of ready-made materials. Students can be invited to find relationships between concepts or find formulas. This will make students more confident that he can be involved in his mathematics lessons. Student self-confidence can also increase if he believes he can come along to find formulas, for example.

Basically, every student has the ability to solve mathematical problems. Therefore, it is important for mathematics teachers to give students the opportunity to solve problems, both individually and in groups, both in the form of open-ended problems and closed problems. Resolving mathematical problems individually can help students understand problems while solving problems in groups can help students improve their understanding. The experience of students solving various problems can increase their self-confidence so that they are not easily anxious if they get other problems.

Since each student can appreciate the beauty and usefulness of mathematics, the math teachers must often show its beauty and usefulness to the students, for example as part of the motivation at the beginning of the lesson. For this purpose, teachers can be assisted by technology. This will make students more motivated in learning math and more technologically literate.

In order for students to appreciate the beauty and usefulness of mathematics, teachers can show it more often at the beginning of learning as part of giving motivation. For this purpose, the teacher can
use technology assistance. There can be found many beautiful buildings whose development requires mathematics on the internet. In the field of medicine, many sophisticated tools are found that cannot be separated from mathematics. In the economic field, there are many decisions that require statistical/mathematical analysis. In the field of disaster, many mathematical models are arranged to describe certain phenomena. If at the beginning of the discussion a topic the teacher can always show the usefulness or beauty of mathematics, it is likely that students will be motivated to study mathematics more actively.

In summary, the results of a study of the relation of Humanistic Mathematics Learning with student learning motivation, math-anxiety, and belief toward mathematics can be illustrated in the following figure.

**Figure 1.** The relation of Humanistic Mathematics Learning with student learning motivation, math-anxiety, and belief toward mathematics

There are many learning resources that can be utilized by mathematics teachers in designing more humanistic learning activities. One of them is the Journal of Humanistic Mathematics. There are many articles, history of mathematics, poetry, song lyrics, and so on, which can inspire mathematics teachers in designing varied learning activities. The article entitled "Preparing Our Student to Read and Understand Mathematics" by Butler [18] and "A selection of Poems from Ode to Numbers" by Glaz [19] is very interesting to study. From the articles in this journal the teachers will get many ideas to demonstrate the usefulness and beauty of mathematics to students.

4. **Conclusion**
Mathematics teachers cannot ignore the human side of students in learning. There is student learning motivation, math-anxiety, and belief in mathematics that affect student learning outcomes. In addition to students 'minds, there are also students' hearts, feelings, and emotions that must also be considered by mathematics teachers when carrying out teaching and learning activities. In order for student learning outcomes to be optimal, the teacher must strive for the realization of healthy and harmonious relationships between student-teacher and students. With healthy and harmonious relationships allows students to learn enthusiastically.

There are a number of important things that must be done by the teacher to make the mathematics class more humanistic. Six of them are: (1) motivating the students by demonstrating the usefulness or beauty of mathematics at the beginning of learning; (2) do not start learning by providing definitions and formulas; (3) controlling their emotion and full of enthusiasm; (4) giving fair attention to all students; (5) giving a respect for every student's learning progress; (6) making varied learning activities.
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