

Improving Student's Emotional Intelligence By Mathematics Learning²

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Abstract.

This paper aims to provide a description of realistic mathematics education in improving emotional intelligence. Mathematics is a tool that can be developed to foster thinking (reasoning) and attitudes (emotions) (Nelissen, 2007). Emotional intelligence is the ability to feel, understand and effectively apply the power and emotional sensitivity as an energy source and as a motivator. The models that emerged from students' mathematical activity can promote interaction in class, thus leading to the level of mathematical thinking and higher learning meaningful democracy. Thus, learning mathematics is a realistic learning actively involves students both physically and mentally (student centered learning), and be democratic, so as to have a better profile in the critical thinking skills and emotional intelligence of students.

Keywords: *emotional intelligence, learning, mathematics, constructive, interactive, reflective, realistic.*

Introduction

The concept of emotional intelligence stems from the concept of "social intelligence" who first expressed by Thorndike in the 1920s (Gardner, 1999) that divides intelligence into three groups, namely;

1. Abstract intelligence, the ability to understand and manipulate with verbal and mathematical symbols.
2. Concrete intelligence, the ability to understand and manipulate objects.
3. Social intelligence, the ability to understand and relate to people.

However, Gardner (1999) incorporate interpersonal and intrapersonal intelligence in the theory of intelligence. Both intelligence is incorporated in social intelligence, and he defined it as follows:

1. Interpersonal intelligence is the ability to understand others, what motivates them, how to work cooperatively with them. Politicians, teachers, doctors, and religious leaders are successful is someone who had a high interpersonal intelligence.

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2. Intrapersonal intelligence is the ability to understand ourselves. This is the capacity to form self model accurate and true and able to use the model to run effectively in life.

Emotional intelligence include social intelligence and emphasizes the influence of emotion on the ability to see the situation objectively and to understand themselves and others. Emotional intelligence functions to sense, understand, and effectively use the power of emotions, distributed as a source of energy, motivation (Maree, JG & M Finestone, 2007) says that *motivation create emotion, and emotion create motivation*), creativity, and influence in daily life -day, at work or in dealing with others and evoke the deepest feelings of hope and purpose in life. Thus, success in life is not only caused by purely cognitive intelligence, but there are qualities such as trust, encouragement, integrity, intensity, creativity, honesty, and perseverance. Another intelligence that this is called emotional intelligence.

Emotional intelligence is a person's ability to control his own emotions and others, to distinguish one emotion to another and use that information to guide the process of thinking and behavior. Cooper and Ayman Shawaf (1997) says that emotional intelligence is the ability to feel, understand and effectively apply the power and sensitivity of emotion as a source of energy and human influence. Thus, in human life, emotional intelligence is a vital necessity that must be owned, and the basic demands as a social creature, because it can prevent someone from dehumanization and demoralization, and can build good relationships with others. Thus, emotional intelligence includes self-control, spirit, and perseverance, and ability to motivate yourself and cope with frustration, the ability to control impulses and emotions, not to exaggerate the pleasure, set the mood and keep the stress load is not crippling the ability to think, to read the deepest feelings of others (empathy) and pray, to maintain relationships with the best, and the ability to resolve conflicts. Thus, emotional intelligence in the field of education is very necessary to be developed in order to get the urge or energy to achieve maximum performance.

Attitudes and emotions in human life is a field of highly complex cognition, and in general are rarely observed on learning in schools. The evidence suggests that the practice of the learning process in schools which took place over the years, and almost

all levels of education is still concentrated on the cognitive ability level of understanding of the brain that tend to rote, whereas the affective realm abilities have grown and developed almost no serious and systematic. Thus, no exaggeration to say that one of the factors that lead to a lack of thinking and emotional abilities of students is partly a way of teaching made the learning of teachers are still using conventional, more emphasis on doing the exercise routine matters or *drill* and less mental activity involving students. Consequences of conventional learning patterns of students resulted in less active and less understand the concept and mathematical values. This condition causes school education we are only able to produce beings who lack self-awareness, lack of critical thinking, less creative, less independent and less able to communicate smoothly with the physical and social environments in life. Then, learning what kind of intelligence that can improve not just the cognitive side alone, but also about the attitude or emotional intelligence, so as to give students the ability to reach maturity themselves in later life?

Discussion

Mathematics is a product of human intellectual thought (Piaget, 1974) which can be generated through the issues pertaining to real life everyday (Mason, & Stacey, 1982). This, means that mathematics has the ability to organize thoughts and solve problems. With the more general phrase, De Lange (2004) says that the competence or ability that is contained in mathematical thinking and reasoning, mathematical argumentation, mathematical communication, modeling, posing and solving problems, representation, symbols, tools and technology. Other sources, NCTM (2000), states that school mathematics standards include content standards that is associated with areas of school mathematics materials, and *mathematical processes*. Process Standards include problem-solving the problem solving process through stages of understanding, planning, action and evaluation (Polya, 1968); reasoning and evidence (*reasoning and proof*) is a process in resolving problems; *connections* which is a characteristic of mathematics that has the concepts related to each other; communication is a way to share ideas and clarifications about the experience and representation, namely the ability to create, interpret, modify, differentiate, and interpret mathematical representations in the form and understand the relationship . Meanwhile, PISA (the OECD, 2008) says that

the competence included in mathematics are, among others to evaluate, giving reasons mathematically, Posing mathematical problems, how to select a mathematical representation of the situation, and mathematical statements. Also stated that the mathematical competence is based on the ability to apply knowledge, understanding and skills are broad, social skills and work context. Thus, it can be said that the mathematical competence include emotional intelligence.

The other hand, Schoenfeld (1994) says that *learning mathematics is doing mathematics*, which means that learning mathematics is to solve the problem. In general, it is said that in resolving any problems always involve the concepts, procedures, strategic thinking, motivation and emotional impulses, which can lead to conclusions and logical action. Thus, emotional intelligence can be created and enhanced through the process of learning and solving math problems. The next issue is learning how that can provide a mathematical values are to be owned by every student.

Related to the teaching of mathematics that is now taking place in schools, Atwood (1990) says that teaching patterns mechanistic or the so-called traditional or conventional teaching as a way of teaching, where teachers more actively explain and give information, then it will not help students develop skills thinking and good interpersonal intelligence. Accordingly, there are some fundamental questions that need to be considered, namely how mathematics can be taught better, how can children be encouraged to be attracted and interested in mathematics, how children actually learn mathematics, and what is the value Mathematically for them?

Many of the ideas of experts who suggested form of education and teaching that can be done by taking into account the cognitive and intellectual mix of emotional kecedasan. Among others, UNESCO has made reference to the learning system based on four pillars: 1) *learning to think*, 2) *learning to do*, 3) *learning to be*, and 4) *learning to live together* (Sidi, 2003). This gives guidance on education and in essence, is to form individuals who are smart in thinking, among high morality and confident and able to do what's best for society. Meanwhile, Glaser (in McGregor, 2007) view that learning mathematics in schools need to connect learning and thinking in specific domains, such as the development of attitudes. Another opinion, Treffers, de Moor & Feijs (1995) and Nelissen (2005) says that the teaching of mathematics is the aspect of thought and emotional attitude is learning that focuses on constructive aspects, reflection, interaction

and development of concepts specific thinking. This is the basis and consideration will be learning math in school is no longer just emphasizes the development of purely cognitive realm, but the mathematical learning process needs to involve physical or mental activity.

Learning refers to learning stages constructive, interactive and reflective learning mathematics is realistic and is called mathematizing process, which in her native country, the Netherlands, called *Realistic Mathematics Education* (RME). The underlying philosophical realistic mathematics education is as human activity (Freudenthal, 1991; Goffre & Treffers, 1985; Gravemeijer, 1994; Moors, E. 1994; de Lange, 1996). So the mathematics should not be given to students in the form of 'results', but a process of the student experience through models constructively and interactively of problems solving, either informally or formally, so find out for yourself or help of adults about mathematical content knowledge or *conceptual mathematizing*. Gravemeijer (1994) suggests that there are three key principles of realistic mathematics education, namely:

1. *Guided reinvention / progressive mathematizing* (guided discovery / mathematizing progressive). This principle refers to the statement of constructivism that knowledge can't be taught or transferred by the teacher, but can only be constructed by the study.
2. *Didactical Phenomenology*. In this learning phenomenon emphasizes the importance of contextual issues to introduce mathematical topics to students. Mathematical topics are taught from the everyday phenomenon in the life of a child of the world.
3. *Self-developed models*. This principle serves to bridge the gap between the informal mathematical knowledge with the formal mathematics of the students.

Of the three principles above, Treffers (1985), De Lange (1987), Streefland (1999) and Gravemeijer (1994) divided the learning process in RME into five characteristics namely: *Constructing and concretizing, levels and models, reflection and special assignments, social context and interaction, structuring and intertwining*.

1. *Constructing and Concretizing*. This characteristics show that learning mathematics is a construction activity, the students discover their own concepts,

principles or procedures for himself. According to this principle, learning mathematics is to be construction activity.

2. *Level and Models*. This property states that in learning the concept or procedure requires a long process and moving from the abstraction that is varied from informal to formal, and the intuitive level to a systematic level. In this case the student has his own solution, which is to bridge the gap between concrete and abstract through the visual and situation models, schematics, diagrams and symbol.
3. *Reflection and special assessment* . According to Hiebert (1992), reflection or metacognition can be defined as a conscious consideration of their own experience, often a link between ideas and deeds.
4. *Social context and interaction*. This characteristic explains that learning is not only an individual activity, but something that happens in society and dealing with cultural social context.
5. *Structuring and intertwining*. In these case the learning mathematics is not the absorption of knowledge and skill sets that are not related, but the study is to construct mathematical knowledge and skills in a unified structure.

Thus, learning mathematics is realistic is the importance of learning through a process of constructive aspects, interactive and reflective.

Conclusion

Realistic mathematics education viewed as an activity which is constructive, reflective and interactive. Starting point of learning rather than learning the rules and formulas, but rather to work with contexts, so students can find their own models and brands can interactively discuss Thus, through interactive activities and students' discovery process with teacher guidance, it will form a good emotional intelligence. Thus, it can be concluded that realistic mathematics education can to improve of emotional intelligence.

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