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MATHEMATICS CLASS ENVIRONMENT: BUILDING UNDERSTANDING OF MATHEMATICS THROUGH COMMUNICATION, LEARNING COMMUNITY, AND STUDENT MOTIVATION*

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ABSTRACT. The classroom environment is often overlooked in mathematics learning, teachers pay attention to the demands of the curriculum more rigorous, tight schedules, and results. While classroom environment that includes the relationships among students and between teachers and students, the cooperation and active participation of students in learning related to students' motivation to learn and excel academically. Learning mathematics is currently recommended to keep students actively engaged in the classroom, willing and able to communicate their ideas, and between students are able to learn from each other. This paper discusses the learning environment by creating communication strategies for learning and a sense of community among the students so that increased student motivation to learn mathematics.

Keywords: Communication, Learning community, Mathematics Classroom Environment, Motivation

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A. INTRODUCTION

Current reform in mathematics education strongly supports the development of mathematics classroom environment where students have the opportunity to be involved in the negotiation of understanding meaning. The classroom environment is not just a physical space, but an overall setting for learning. This includes the relationships among students and between students and teachers, as well as hope and community to learn and behave. Teachers are challenged to develop a classroom environment as "a learning environment that encourages learning conversations and learning partnerships with challenges, feedback and support available".

The teacher's role is very important to build courage students to communicate their ideas and mathematical reasoning. What matters should be discussed is how students can interact collaboratively. Teachers with students through pedagogical actions directly with building a learning community. Developing a learning community that promotes mathematics interactive math talk challenging for many teachers and students, especially because the culture is not in classes with traditional learning. Therefore, teachers need to work hard to change the culture of the traditional classroom. Numerous studies have shown that the classroom environment has a significant impact on student achievement, as well as emotional and social outcomes at all grade levels (Fraser, 1994; McRobbie & Fraser, 1993, in Stepanek, J, 2000).

In fact, positive classroom environment has shown improvement in student learning outcomes which enabled low (Pierce, 1994, Stepanek, J, 2000). These findings suggest that the lack of ability of students is not the only reason why a low student learning outcomes. The purpose of this paper is to describe the learning strategies that can be used to create a classroom environment in which students are trained to think, talk gives an idea, approved and denied, and the students are familiar with the distinction owned by each student.

B. CHANGING CLASS ENVIRONMENT

The classroom environment plays an important role in learning. Research on the characteristics of an effective learning environment suggests that the changes need to be done in math class. Traditional learning, where teachers explain and guide students to

facilitate learning. There are three main reasons for the need to make changes to the classroom environment, namely to: make the classroom environment more enjoyable for students, supports students actually learn, and encourage standards-based teaching and learning.

According to Henningsen & Stein (1997), Huffman, Lawrenz, & Minger (1997), McLeod (1992), and McRobbie & Fraser (1993) in Stepanek, J, (2000) the key to improving the learning environment in mathematics classes are:

a. Support the relationship between teachers and students
b. Participation of students in creating classroom norms, make decisions, and set goals
c. Expectations and responsibilities are clear
d. The opportunity to work
e. Ample time to complete assignments and discussion.
f. The opportunity to work on open issues.
g. Meaningful and exciting activities

Knowledge Helps Students Build Their Own

Beliefs and theories about how children learn to also change your ideas about the schools and classrooms are preferred. Many educators believe that learning is not just a mere transmission of information from teacher to student, but with the students creating their own knowledge. This is consistent with a constructivist view of learning which states that students are actively involved in creating their own knowledge and understanding and by connecting what is being learned with prior knowledge and experience. "Someone who learns ideate" said Resnick, 1983 (Suparno, P, 1997). While Bettencourt, 1989 (Suparno, P, 1997) says that people learn not only imitate or reflect what is being taught or what he read, but to create understanding. Knowledge or understanding is formed by the students actively, not just passively received from their teachers.

Building knowledge and understanding of the process of social interaction. Students learn from each other by sharing ideas and perspectives, ask questions, and develop methods and ideas together. The process of communication about their thinking and work together to create a way of thinking is very important for learning. The learning

environment is a key component in guiding students toward interactive and constructivist approaches to learning. Some of the features that help to create an environment includes small group discussions, students develop research topics and investigations, the active involvement of students, and the evaluation that emphasizes reasoning, evidence, and personal interpretation rather than only correct results. NCTM (Vann De Walle, at.al, 2008). emphasizes the active participation of students in the classroom, cooperative learning, and create and maintain a safe environment. Influence of classroom environment on student motivation and enthusiasm are very important when students are asked to develop a deep understanding of the mathematical challenges.

C. COMMUNICATION AS A PROCESS OF SOCIAL INTERACTION

Communication as a relationship between teachers and students has been a great deal of attention in the field of education, given its relevance in the process of teaching and learning. According Brendefur & Frykholm, 2000 (António Guerreiro, A. & Serrazina, L., 2009), the role of dialogue and information sharing are emphasized in mathematics learning now against traditional forms of learning mathematics where communication is based on one-way discourse, conducted by teacher . Communication is characterized as a process of social interaction. In the process of interaction, the subject and the experience of their construction, through the negotiation of meaning between individuals (Yackel, 2000, in António Guerreiro, A. & Serrazina, L., 2009).

From the point of view of communication as interaction, learning arises from the interaction between individuals and cultures, including the interactions between students and teachers. Communication is considered as a process of social interaction, which allows the subject to identify himself or herself with the other, and at the same time, express and assert its singularity, and has the function of creating and maintaining an understanding of the individual (António Guerreiro, A. & Serrazina, L ., 2009).

Thus, teaching is understood as an interactive process and reflective, between teachers and students on a continuous basis. With this activity, the meaning is formed in the process of interaction between subjects, and not only the transmission of knowledge from teacher to student (António Guerreiro, A. & Serrazina, L., 2009). Communication or

dialogue between teachers and students in the classroom lead to an understanding of communication as a way to continue building ideas that have been validated by the teacher. Avoiding errors in the learning of mathematics seems to be one of the causes of students' communication barriers. It can be because the teachers are like students who correctly answered immediately.

Communication needs to be a focus of mathematics in mathematics learning, because through communication, students can consolidate mathematical thinking (NCTM in Asikin, M., 2009), and students can meng'explore 'mathematical ideas (NCTM in Asikin, M., 2009). Need an attempt to "mentradisikan" effective communication in the mathematics classroom. Streamline the communication in the classroom is an essential requirement for learning mathematics present and future; tumbuhkembangnya that can lead to social skills. This is also consistent with a function in the math lessons as a way to communicate ideas in a practical, systematic and efficient.

The question is, how will foster students' ability to communicate through the learning of mathematics? The answer to that question turned out to be related to how the teacher's efforts to build a community of math classes that are conducive to the growth of the ability to communicate (Asikin, M., 2009). This is consistent with those described in School Mathematics Principles and Standards (NCTM, in Asikin, M., 2009) that in order to support learning in the classroom in order to be effective, teachers must build a community where students feel free to express and communicate thoughts.

D. ENVIRONMENT LEARNING COMMUNITY IN MATH CLASS

Learning mathematics is not an isolated activity or passive, but it is a process that makes sense and construct meaning, both individually and together. Mathematics promotes the idea of creating a learning community with a common goal to understand mathematics. The concept of community is very important to study because it facilitates social interaction, active participation, and support each other.

Class community characteristics include: accept differences of ideas, skills, and experience; students' responsibility for their own and each learn from each other and collaborate (NRC, 1996, in Stepanek, J, 2000). In a community, teachers help students to

learn from each other. Class structure varies, with the opportunity for students to work independently, in a variety of teams and small groups, and whole class. In addition, teachers consistently demonstrate respect for students' ideas and ways of thinking, encourage them to ask questions, make assumptions, and validate their solutions (NCTM, in Stepanek, J, 2000).

Thinking about the school or the class as a community is not a new idea. John Dewey appreciate the idea of the school and the classroom as a community, and this approach is helpful in understanding the classroom community. For Dewey (Stepanek, J, 2000), the class community is not just a name for a collection of individuals or an ideal of harmony and cooperation. This is the man to live, work, and especially learning together. There are three class model which may be useful in thinking about and creating a community of learners. There are many similarities between the three approaches, and they all help to create the necessary environment for learning.

1. Democratic classroom.

The main purpose of the class is to share ideas of democracy, using critical reflection and analysis, and promoting the common good, Beane & Apple, 1995 (Stepanek, J, 2000). A class is said to be democratic where all the students sounds disconnected and organizational learning. This does not mean that students are just doing what they tend to do. Rather, it is the process of giving students share authority in the classroom, but it is not subject to them.

In a democratic classroom, students have the opportunity to participate actively, which also allows them to persevere in challenging mathematics. Participating in the classroom or school based on the principles of democracy helps to prepare students to use their mathematical knowledge as citizens. Finally, democratic class relationships that support and promote a safe environment with a focus on respect and concern for all members and the general welfare class.

Here are some principles to build a democratic classroom:

a. Students participate in decision-making.
b. Teachers and students think of themselves as members of a learning community

c. Planning collaboratively with students helping to bring their interests and concerns on what they learned.
d. Diversity is valued for enriching experiences and perspective.
e. Teachers and students have a common goal in learning together and helping one another more emphasized than compete with each other.

2. Classes are concerned.

The relationship between teachers and students is the primary focus of the class concerned. There are many positive outcomes associated with caring relationships in the school, including higher performance, a strong motivation to learn, greater interest in school, and fewer behavioral problems, Lewis, Schaps, & Watson, 1996 (Stepanek, J, 2000). In a caring classroom, all the students know that they are important and have something to contribute.

There are two ways that concern the concept can be applied to learning. First, there is the sense that the students have been concerned and their mutual care for one another. This is important in building trust, security, and collaboration necessary for learning math challenging. Matter also involves the relationship of students with mathematics disciplines. When a student is concerned about the content and ideas that he learned, he made an emotional investment that brings energy and enthusiasm to understand.

Some characteristics of the concerned class include:

a. Teachers establish a warm and supportive relationships with and among students
b. Teachers build student interest in learning and making meaning.
c. Curriculum challenging, important, and thematic, more focused on long term goals of learning rather than "coverage".
d. Teachers drop support students' intrinsic motivation instead of using rewards and punishments for student compliance.
e. Students help build classroom behavioral norms in the interests and welfare of

3. Ecology class

All classrooms are complex systems, with dynamic interaction and unexpected events. See the class as an ecological system is another way to create a learning community. In an ecosystem all aspects of life are interrelated and interdependent with each other well. Learning and teaching are also built on relationships and interdependence. Teachers with a view ecology know that students have a relationship with each other and with the teacher is essential for learning.

Adopting the ecological perspective encourages teachers to take a more interactive or responsive in class and become part of the system. The diversity of life in an ecosystem is necessary for survival. Life in the classroom is also enriched with experiences and different cultures are brought teachers and students. Learning is not an individualistic activity, but a collective effort, and everyone was able to learn from one another.

a. Ecology class will include the following elements.
b. Teachers stay in tune with the relationship between classroom climate and learning.
c. Teaching and learning is a reciprocal process.
d. Interdisciplinary Connections are made as much as possible.
e. Attitudes and perceptions included as an element of the learning process.
f. Teachers are sensitive to the effects of students' lives outside the classroom Hassard, 1990 (Stepanek, J, 2000)

E. MOTIVATION

The teacher's role is to generate a very basic motivation for learners to be more actively studied. There are two types of motivation, namely intrinsic and extrinsic motivation. Intrinsic motivation is motivation or drive and passion which arise from the learners themselves, for example, want to get practical benefits from lessons, to receive an award from your friends, especially from teachers, want to get a good value as evidence of "can do". Extrinsic motivation refers to the external factors that have promoted the emergence of a passion to learn, such as social environment that builds in the group, the physical environment that provides a comfortable atmosphere, pressure, competition, including adequate learning facilities and intriguing.

One motivation is to foster a fun classroom environment. According to the NCTM 2000 (Mueller, M., Yankelewitz, D., & Maher, C., 2010): "More than just the physical setting ... classroom environment communicates subtle messages about what is valued in learning and doing mathematics ". NCTM further illustrates that environmental factors such as class and mathematical tasks provide a complete overview of how to develop students' conceptual understanding. Similarly, according to Bransford, Hasselbring, Barron, Kulewicz, Littlefield, & Goin, 1988; Cobb, Wood, Yackel, & Perlwitz, 1992; Middleton, 1995; Middleton & Spanias, 1999 (Mueller, M., Yankelewitz, D., & Maher, C., 2010), supporting the classroom teacher and the environment plays an important role in the development of other sources of intrinsic motivation.

Based on research conducted Cheng, 1994 and Uguroglu & Walberg, 1986 (Stepanek, J, 2000), suggests that motivation is closely related to academic achievement and learning environment. Motivation related to achievement in mathematics and attitude. Currently, there is a downward trend in mathematics achievement were associated with a decrease in student interest and motivation in mathematics. There is a general decline in achievement motivation in middle school students, with the largest decline in intrinsic motivation happens in science. Characteristics of the learning environment can explain this decline, including the deterioration of the relationship between teachers and students. Thus, based on NCTM and some of the results of research on motivation, there is a link between the classroom environment with motivation. Influence of classroom environment on student motivation and enthusiasm are very important to develop a deep understanding of the mathematical challenges.

F. CONCLUSION

To help students learn mathematics with understanding is to create a classroom environment where communication and community conducive to student learning to walk. Students are trained in learning to talk, help each other, share ideas, and build on the ideas of other people's thoughts. Establish good communication in the mathematics classroom needs to be a focus of attention, because it is through communication students can consolidate mathematical thinking. Communication skills of students can be formed by

teachers by building a community that is conducive math class with a good classroom environment where conducive learning community, and students can communicate freely express his ideas fit class norms, based on the results of the study it can be improve mathematics learning outcomes and student motivation. Improved results demonstrate an understanding of students' mathematics learning mathematics students.

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