

## DEVELOPING STUDENT'S INTEREST IN MATHEMATICS LEARNING THROUGH COLLABORATIVE PROBLEM BASED LEARNING MODEL

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### Abstract

There are something principal to push pupils to learn. One of these is interest. The teacher must be agent to develop the student's interest to learn in mathematics. Collaborative problem based learning model can be optioned to improve the student's interest. Collaborative problem based learning is the combine of problem based learning approach which is done collaboratively. Starting point with a problem in real world, Collaborative problem based learning can do with structure: ((1) given problem to solve/formulate individually; (2) students share their answer to their group; (3) students listen carefully their partners answer in group, they can discuss their answer by note similarities and differences in discuss paper; (4) after discussing, they solve the problem individually by creating a new answer that incorporates the best idea and students have a chance to presents their answer in front of class. The main purpose of this paper is to investigate about student's interest and how to develop it through a collaborative problem based learning model.

**Keyword:** Interest, collaborative problem based learning

### INTRODUCTION

Students in the class comes with different wide range of academic abilities, the teacher should be able to anticipate it to produce good learning outcomes. Many factors have suspected as the cause of students learning outcomes are not good; one of them is that student's interest. That assumptions about the difficulty of studying mathematics and mathematics are less useful in real life still dominates students' thought, so that many of them less interested in studying mathematics, whereas according Hidi & Harackiewicz (Prendergast, 2011) interest has a powerful influence on academic performance.

A math teacher should be able to help foster even develop students' interest in mathematics to produce good learning outcomes. Alexander (Prendergast, 2006) states "*that interest can be the key in the beginning of learning*". Without developing a good interest, it is likely that the view of mathematics is a difficult subject and are less useful in real life will be stronger, this view supported by Sriyanto (2007) that one of the important tips that can successfully learn mathematics is to grow interest in the mathematics.

Hence the importance of the interest in learning, collaborative problem-based learning model could be an option to develop students' interest in mathematics. This paper will focus on what is interest and how to develop it through collaborative problem-based learning model.

### EXPLANATION

#### A. Interest

Interest have a great impact for person; with interest will determine what is done by a person. Most people will do things based on their interest. Elliott et al (2000) states "*interest is similar and related to curiosity. Interest is an enduring characteristic Expressed by a relationship between a person and a particular activity or object*". According to Sanjaya (2013) interest is the tendency of an individual to do activity; interest is an aspect

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that can determine a person's motivation to perform some activities. Nitko & Brookhart (2007) states that "*Interests are preferences for specific types of activities when a person is not under external pressure*". Nunnaly (Gable, 1986) states that "*defining interest as preferences for particular work activities*". Gable (1986) "*interest can be described with regard to Reviews their targets, direction and intensity. The targets of interest are activities: the direction can be described as interested or disinterested; and the intensity can be labeled as high or low*". According to above opinions, it can be concluded that the interest is the tendency of a person to an object or a particular activity.

In the classroom students are said to have expressed the interest, according Djamarah (2008) that learners prefer something than others, active participation in the activities, greater attention to something that interesting without eliminating other things, this is in line with Hidi & Renninger opinion (Cho & Lawrence, 2012) "*students are learning with interest, they tend range to devote more attention to the topic and pursue a task with pleasure*". According to Strong (Savickas & spokane, 1999) there are 4 elements of interest that "*the first two qualities that strong Attributed to interest were persistent, attention and a feeling of liking for an object. The third quality strong direction Because liking called steers a person toward an object and dislike steers a person away and the last attribute of interest was activity, in that an interested person does something regarding the object*". Based on the above opinions, the interest of the students towards mathematics can be viewed from several aspects that feeling when studying math, attention to mathematics learning, curiosity and participation in learning.

Considering the importance of Interest so the teacher needs to arouse interest or maintain student interest. According to Elliot, et al., (2009) there are five steps that can be performed by teachers to foster and facilitate interest in learning(1) *Inviting students to participate in meaningful projects with connections to the world outside of the classroom;* (2) *Providing activities that involves students' needs and provide them developmentally appropriate challenge;* (3) *Allowing students to have a major role in evaluating their own work and in monitoring progress;* (4) *Facilitating the integration and use of knowledge;* (5) *Learning to work cooperatively with other students.* According Mitchael (Woolfolk, 2007) "*using computers, groups, and puzzles caught interest students in secondary mathematics classes, but the interest did not hold. Lessons that held interest over time included math activities that were related to real-life problems and active participatons in laboratory activities and projects*" according Djamarah (2011) some way arouse students' interest are: (1) Connecting with the issue of experience of the students, so that students can receive easily the learning materials; (2) Providing opportunities to get good results by creative and conducive learning environment; (3) Using various forms of teaching.

Based on the opinions above can be concluded that the way to generate and maintain interest is the use of problems related to everyday life and make students actively participate in learning, this is in line with the results Mitchell (1993) that two factors that can maintain the students' interest are *meaningfulness of the task and student involvement, Meaningfulness refers to students' perception of topics as meaningful to their own lives. Involvement refers to the degree to which students feel they are active participants in the learning process.*

## **B. Problem Based Learning (PBL)**

Problem-based learning is student center approach. According to Arends (2008) Problem based Learning is presenting real world problem and meaningful to students who can serve as a stepstone for investigation and inquiry, so Problem-Based Learning approach requires creativity of a teacher to select a problem with challenging situations that allow students motivated in formulation the problem, asking questions and solving qualified problems that can be solved..

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In problem-based learning, students will easily to understand and remember when students can see the relationship between something that learned by their daily activities. According to Delisle (1997) he states that the "*Problem Base Learning offer section with problems that are close to real life situation as possible*". Problem-based learning gives students to learn academic content and skills to solve the problem involved in various real-life situations . This learning according to the NCTM (1989) "*Most mathematical concept or generalizations can be Effectively Introduced using a problem situation*". The statement gives meaning that most of the concepts or generalizations can be introduced effectively through the provision of a problem so problem is starting point of learning.

The challenge for teachers is how to provide the exact problem for students, this type of problem in PBL by Herman (2007) consists of two things: (1) Ill Structure or ill defined; (2) Well Structure or well defined. Structure Ill be lead to problems in the form of open-ended, while Well defined by Mayer & Wittrock (Eggen & Kauchak, 2012) are problems with one solution that is true and certain methods to find it. Giving the problem according to the ability of students is in line with the opinions Arends (2008) which is problem should be meaningful for students and accordance with the level of development.

PBL step by **Arends** (2008) (1) Giving the orientation of the problem to students; (2) organizing the students to examine; (3) Assisting the investigation independently and groups; (4) Developing and present the artifacts and exhibit; (5) Analyzing and evaluate the process of answer the problem, while the pbl step according to **eggen & kauchak (2012)** (1) Reviewing and presenting problem; (2) Develop a strategy; (3) Implementing the strategy; (4) Discussing and evaluating the results, while according to **Johnson & johnson** (Sanjaya, 2006) PBL steps are (1) Defining the problem; (2) Diagnosing the problem; (3) formulate strategic alternatives; (4) Determining and implementing the strategies; (5) evaluation. based on the steps of some experts, problem-based learning above can be concluded contains major steps, those are: (1) Orientation on the problem; (2) Organize the students to examine; (3) Assist the investigation independently or in groups; (4) Evaluation

PBL has advantages than the conventional approach; some of them quoted from Sanjaya (2013) are as follows:

- 1) Problems Solving in PBL good enough to understand the lesson content.
- 2) Assisting students in transfer process in understanding the problems in real world.
- 3) PBL creates a fun learning environment and student preferred.
- 4) Allowing the application in the real world

Although it has some advantages but it does not mean there are no problems in the implementation of problem-based learning, according to Widjayanti & Wahyudin (2011) in the implementation of Problem Based Learning one of these obstacles is the heterogeneity both in the aspect of initial ability, level and speed of thinking, and motivation to learn. One way that can be used to overcome the heterogeneity is to use collaborative learning model.

### C. Collaborative Problem Based Learning

There are a lot of similarities models between the collaborative learning and cooperative learning, but also there is a difference between these models. Cooperative and collaborative learning are very appropriate to approach the mastery of knowledge / skills base. According to Warsono & Hariyanto (2013) collaborative learning source from English while cooperative learning sourced from the United States. The Developments in the UK considers that collaborative learning is so different from cooperative, while in America considers that different collaborative learning with cooperative learning. According Gallavan & Juliano (Maxim, 2010) states that "*cooperative learning on the other hand is a type of collaborative learning where students works together in small teams in more highly prescribed manner*".

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The traits of collaborative learning by Watkins, Eileen & Lodge (2007): (1) Through collaboration created something new; (2) The collaboration take place when all members can contribute. This view was supported by Gallavan & Juliano (Maxim, 2010) that the main point in collaborative learning is freedom and creativity, where the function of the group is able to produce different results while in cooperative learning that function of the group produces results the same one. Based on these conditions, in the collaborative learning students can be given the freedom to explore their perspective on the problem.

Existing collaboration in collaborative learning will make students become effective learners, according to Watkins, Eileen & Lodge (2007: 91) "*With collaboration, learners become effective help-seekers and effective help givers. Help seekers can explain Reviews their confusion and ask specific question for help .... Help givers can check Whether Reviews their explanations have been understood and Whether confusion have been clarified*"

Srinivas (Warsono & Hariyanto, 2013) revealed that there are five principles of social constructivism in collaborative learning:

- 1) Learning is an active process in which students assimilate new information and linking this knowledge within the framework that they have.
- 2) Learning need a challenge that opens the door for students to actively with the group, as well as processing and synthesis of various information than simply remembering and swallow them in raw.
- 3) Learning will grow well in a social environment where there is an active conversation among students.
- 4) The students will benefit greatly from learning because of extensive information from a variety of different viewpoints with his own eyes.
- 5) In the collaborative learning environment each student will be challenged both socially and emotionally due to get a different perspective, which then requires the grant of articulation of the idea, as well as various attempts to defend his ideas.

The structures of collaborative learning by Watsikns, Eileen & Lodge (2007) are:

1. *Formulate your answer to the question individually.*
2. *Share your answer with your patner*
3. *Listen carefully to your patner's answer. Note similarities and differences in your answer*
4. *Create a new answer that incorporates the best of the best idea. Be prepared to present your answer if called upon.*

First, all teachers need to create a worksheets which characterized by problem-based learning by combining several steps that intersect with problem-based learning which is done collaboratively.

problem-based learning approach which is done collaboratively later called collaborative problem-based learning is considered very suitable for developing students' interest because it use real world problem in everyday life and the students are involved in a group activity with each student contribute to give a thought to the group, it can be supported by the results of Widjajanti's research (2011) who conducted research at the college level that this model can improve mathematical problem solving ability and belief of student in mathematics learning.

#### D. CONCLUSION

Collaborative Problem Based Learning is recommended to be implemented in the learning of mathematics in the classroom because of the theoretical and based on a review of relevant research is believed that to be able to develop students' interest. In order to implement this model in the study of mathematics in the classroom, teachers need to design

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worksheets which contains problem in such a way that further implemented collaboratively.

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