Chapter 13
Preliminary Analysis of Using Games in Problem Based Learning in Learning Mathematics

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ABSTRACT
The growing awareness of mathematic competency in education and careers has been as an important agenda among parents and students nowadays. Thus, teaching mathematic effectively is a challenge to educators in schools and higher institution. The combination of Problem Based Learning method and game in mathematic environment can be synchronizing to help students mastering mathematic knowledge heuristically. The objective of this paper is to highlight the literature review and the preliminary analysis done in the early phase of the research of Using Game in Problem Based Learning in Learning Mathematic. The paper also discusses the research framework that is divided into 3 parts; control mode, development, and testing.

1. INTRODUCTION
Malaysian government is attempting to produce knowledge worker in science and technology by year 2020 (Sam et al., 2009). These fields acquire graduates who are skills and knowledgeable in mathematic. Therefore the growing awareness of mathematic competency in education and careers has been as an important agenda among parents and students.

The findings of the Trends In International Mathematics and Science Study (TIMSS) 2007,
were internationally released on December 9, 2008, reported that Malaysia plunged from No. 10 placing in Mathematics in TIMSS 2003 to No. 20 placing in 2007. It is therefore important to identify and recognize the factors that could influence students’ mathematics achievement in order to help them improve and make substantial academic progress.

Problem based learning or PBL is one of the big success approaches in education in the last decades. It is a research in the cognitive sciences on how we learn as it improves learning. According to Tarmizi et al. (2010), in problem based learning, the learning environment gives students opportunities to examine and try out their previous knowledge, discover what they need to learn; develop skills while solving problems; improve communication abilities, to state and defend with sound arguments and evidence their own ideas; and to become more flexible in their approach to solve problems.

2. PBL IN MATHEMATIC EDUCATION

The primary purpose for teaching mathematics is to enable students to learn and appreciate mathematics in the best way possible. In conventional classrooms, the usual way of teaching is the chalk-and-talk or whiteboard method. Teachers give the input verbally or write on the board and the students follow their instructions.

Many students do not like learning mathematics and often perceive mathematics as unpleasant and a hard to learn subject. Serkan (2009) agreed that mathematics is usually taught in ways that make the information uninteresting, irrelevant and disconnected to students’ experiences pave the way toward an ever growing population of individuals with mathematical anxiety.

Problem-based learning in mathematic is an instructional approach where students are confronted with a real problem and challenged to work towards a solution (Ali et al., 2010). In order to solve problems, students will have to engage in a variety of activities such as analyzing problem, gathering information and forming solutions. As students tackle these activities, the students have more opportunities to think critically and represent creative ideas and communicate with peers mathematically (Ahmad et al., 2010; Zakaria et al., 2010; Ke, 2008).

In such a way, PBL may build intrinsic motivation among students as it has been proven by Akinoglo and Tandogan (2007) that PBL had positive effect on academic achievement and attitudes toward students’ development.

3. GAMES TECHNOLOGY IN PROBLEM BASED LEARNING

The robust of PBL in education cannot be denied. Thus, comes the challenge of creating and integrating educational technologies that to enhance PBL environment. Kennedy, Kennedy, and Eizenberg (2001) concluded that if designed appropriately, educational technologies could complement and support the PBL environment.

With the entry of technology into the classroom, the teaching of mathematics is changed. According to Ugurel and Morali (2010), with creativity, passion, and resources available to teachers, they are able to implement various techniques and strategies in the classroom to make learning more meaningful and interesting to students.

In addition, with the advent of technology-rich teaching on a large scale, there are now many new opportunities for creative and innovative teaching and new relationships both with students and the shifting world of knowledge. The development of technology in recent years has prompted changes in teaching and learning strategy especially in higher education.

Games is seen as a model that can improve learning environments by providing goals, challenging, collaboration, students have control over their learning process and incorporating novelty