

# The Student's Perceptions of Learning Mathematics using Flash Animation Secondary School in Indonesia

Kalbin Salim<sup>1</sup>, Dayang Hjh Tiawa<sup>2</sup>  
FP, UTM<sup>1</sup>, SITC, UTM<sup>2</sup>

## Abstract

The purpose of this study was to determine the students perception on the use of animation courseware in math and to reveal how the sample courseware learning mathematical concepts to different change students' views. This research is a case study involving three mathematics students at SMAN 2 Bintan. Data were collected by means of semi-structural interviews. The findings showed that learning by using flash animation is very help students in understanding abstract mathematical significantly. Courseware of mathematics by using flash animation to give you a visualization that links between mathematics and the real world and the interests of understanding mathematical concepts. Analysis of the data indicated that the conventional learning needs to be done to understand the fundamental and flash animation for learning technology can be used as an aid in the understanding of concepts and to enhance the way students think more effectively. Courseware of learning the flash animation has shown a different view to the learning process in the classroom, flash animation is able to analyze the mathematical concepts invent and can provide ideas that connect students with a basic understanding of new knowledge.

**Keywords:** Teaching technology, Animation, Mathematics teaching.

## INTRODUCTION

The view of constructivism indicates that new knowledge is not passively received by students through textbooks, teaching and learning in the classroom, or just by rote. Students learn more effectively if they have the experience to implement the ideas that the They have a new situation. From this perspective, the use of technology has a very important role (JM Mills, 2003)

Several studies have shown that by using technology in mathematics learning can build the innovation and creativity of students (S.Durmus, 2001; Mcdonalds, 2005). By learning technology can give a positive value to students including; (1) acquire knowledge by making experiments, (2) make mathematical concepts more concrete, (3) can develop or enhance students' conceptual knowledge of mathematics, (4) can represent learning mathematical concepts are abstract, (5) can motivate so that learning math more fun and meaningful learning (E. Bukova, 2006). Animation in mathematics learning can be made in the form of learning courseware. There are many forms of computer-based learning courseware. Animation can be used to provide information and assist students with understanding the dynamic process to build new knowledge (MJ Taylor, 2008). Animation appears to provide a change in teaching methods. Conventional teaching that is teacher-oriented learning as the transfer of knowledge tend to rely on faculty interests rather than the needs of learners, resulting in learning activities less attractive and elusive student. Learning to use technology is a change in the learning process of migrating to the student oriented. Animated Learning math can affect students in how to think creatively to build mathematical concepts. This study focuses on the perceptions of students in mathematics on the use of animation created using Adobe Flash CS 6. The purpose of this study was to determine the perceptions of students in mathematics on the use of Flash animation and to reveal how the forms of the abstract can evident as in the daily life of students The technology has great potential in the study of mathematics, can be used to improve student achievement and to help develop math concepts (T. Kurz, 2004). Technology can facilitate mathematical problem solving, deep understanding, communication and reasoning in mathematics. Technology can provide the opportunity for students to explore different experiences in learning of mathematical ideas, supports students in making mathematical connections both inside and outside the hours of math, and allow students to focus in reflecting on learning (M. Niess, 2006) . Technology has a very important role in learning tang mathematics to help students with the requisite development of the concept already has a strong base of knowledge, the learning by using technology more effectively (KB Smith, 2006).

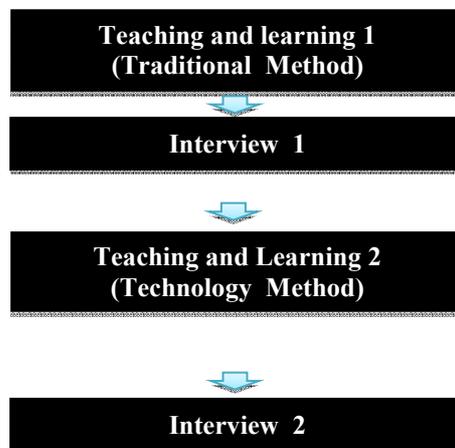
## METHODOLOGY

The design used in this study are three students of SMAN 2 Bintan for Three Dimensional subjects. The experiment was conducted two meetings at the end of the even semester 2012/2013. Learning to topic created using three-dimensional Adobe Flash CS6 program that consists of six parts including four sub-sections for the three-dimensional material, a sub-section of the sample questions and sub-section exercises.

## Steps and procedures of research

Case study design used in this study involves three mathematics students. Learning mathematics for three

dimensional topic conducted 2 meetings. The first meeting in the conventional manner and the second meeting is done by repeating the learning by using technology that is with courseware mathematical learning that has been created with Adobe Flash CS6. Each completed study conducted interviews with three students were taken as a sample research (qualitative assessment) as the following workflow:



Data were collected from semi-structural interviews consisted of two phases: the first interview and the second interview. The purpose of the first interview is to determine students' views on the use of flash animation in building mathematical concepts before learning using flash animation. In the second phase of the same material and learning by using flash animation was introduced to the students. The purpose of the second interview was to determine how students' views about the use of flash animation to build understanding of mathematical concepts after learning courseware run.

### Subjects of Research

The method used was purposive sampling (Sugiono, 2010). The subjects were students of Class X SMA Negeri 2 Bintan. Three of the students were taken as subjects for this study showed different abilities on their understanding of the use of computers in learning. The first student named Mohammed Guntur with initials A that has the knowledge and experience of computer programs is limited. The second student named Nursafitri with the initials B has more knowledge and experience about the computer program. A third student named Fitri with the initials C, which have a lot of knowledge about computer programs.

### Instrument

Data collection techniques in this study used a qualitative approach (Sugiyono, 2010). Interview instrument used to collect data in this study. The questions were set up to have the nature of semi-structured interviews. In addition to the questions systematically guided and open to students who are made in the study sample was also given the opportunity and the freedom to express their opinions in accordance with what they have and they understand for learning mathematics by using flash animation. Open-ended questions were also given regarding how flash animation affects math and math concepts.

### Learning materials

This study used a flash animation as a material to determine the students' views on Flash animation in math and whether the views of students when they are faced with different examples and is there the addition of understanding the concept of them. While courseware of learning about some of the mathematical concepts that developed the principles of constructivism is also used in this study. Are courseware mathematics learning is suitable for constructivist concepts. Courseware of learning built for improve student understanding of mathematical concepts. Flash animation can illustrate real-world examples in daily life and apply them into mathematical concepts. Courseware of learning of mathematics is essential to integrate real-world and mathematical concepts students construct knowledge (S. Durmus, 2001) into the mathematical model. It is intended that the materials presented in courseware r mathematics learning should be interesting, emphasizing concepts, critical thinking and make learning meaningful mathematics. Six sub-sections presented courseware learning about topics such as flash animation in three dimensions comprising: an understanding of distance, an understanding of angles in three-dimensional space. Some examples are shown in Figure 1, 2, 3, 4, 5, 6.



Figure 1. Distance dots with lines



Figure 2 Distance point to the field



Figure 3. The distance line by line

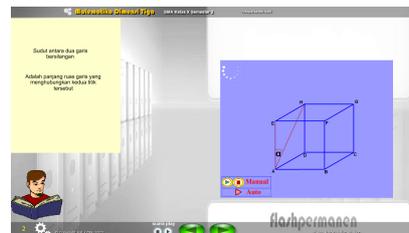


Figure 4. The distance line with the field

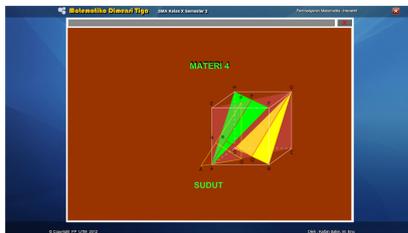


Figure 5. The angle of the line with the line of

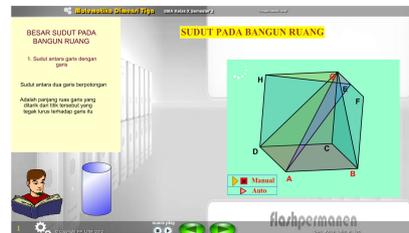
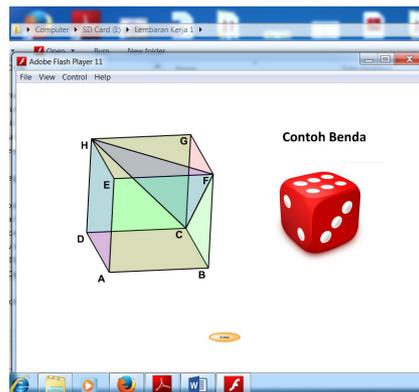


Figure 6. The angle of the field with the field

For example, in Figure 1 and Figure 2, it is intended to establish the concept that the distance between the object with other objects considered is the closest distance that is the distance that took the upright position, in Figure 1 the distance point to a line is the shortest distance that takes a position perpendicular or 90°. Similarly to figure 2 the distance to the field point is the position of the point closest to the field and figure 3 shows the distance of the line to the line is the position of the line closest to the line. Figure 4 shows the implementation of the distance to the field line is the line closest to the field, the flash animation software can be seen as a projection of how motion picture 4. The following three-dimensional images that students need to understand:



When asked the students what is the distance between the field ABCD HCF field, this question most students confused to measure and determine the answer by looking at the picture when've missed that the distance of the two fields are equal to zero, because one corner of the field huddle. Figures 5 and 6 show the understanding of the concept of angle, if the image is viewed in a static (no animation), the lines in three-dimensional space is difficult to be understood by students, but by using both static and manual animation will make the student more schools.

### Data Analysis

The process of data retrieval is done by means of interviews and recorded using an audio recorder. Results of interviews in transcript and then in accordance with the purposes of research analysis. Each of the interviews in

both the analysis of the first interview and the second interview. Is there a difference in students' understanding about the use or not of learning by using technology.

## RESULTS AND DISCUSSION

### 1. Students Initials A

The results of the first interview conducted on A. The first interview A very common saying sentences such as; Using flash animation contribute positively to the learning of mathematics and save time in math. After learning to use a second interview courseware and A said it was pleased with mathematical learning courseware because A had not seen applications or courseware previous learning. And flash animations displayed has changed the perspective and Y in the understanding of mathematical thinking. In a first interview who said not yet know about the abundance and flash animation after learning by using a mathematical courseware expressed many ideas in understanding mathematics with the flash animation. A indicates that the flash animation can connect the real world with mathematical concepts, emphasizing the concept of critical thinking and creative thinking, math concepts can improve of students understanding because of the animation. A saying really want to use flash animations for all math topics. Want to learn more about the animation program.

### 2. Students Initials B

In the first interview, B states that the flash animation gives a lot of benefits for mathematics. B says that the flash animation can solve problems and help students understand mathematical concepts more concrete abstract to visualize related to the real world. Flash animation can provide an understanding of mathematical concepts, giving students' motivation, improve students' mathematical thinking, improving students' reasoning skills. In the second interview B says that the use of flash animation has opened up the nuances of thinking students (i) provide inspiration for creative thinking, flash animation provides an opportunity to discover something new in the understanding of mathematics learning. Creating a concept that is difficult to understand or something abstract becomes more concrete. Provide solutions to understanding misconceptions. B says flash animation influenced the students' way of thinking and understand different points of view. This animation can attract the attention of students, makes math into a fun lesson. Conclusion of the view that the use of B is a flash animation in math is perfect for constructivist principles. Students can be creative and intuitive thinking about mathematical concepts.

### 3. Students initials C

In the first interview C says that flash animation can make mathematical concepts are abstract in concrete by means of visualization display, and can connect with the real world to mathematical concepts. C never had a class of computing but not with flash animation. After the second interview given B said after learning of mathematics with flash animation B says very interested and want to explore all of mathematics learning materials using flash animation. Because previously never got it. C says love for all the animations, especially about the concept of geometry as it is always difficult to understand about the distances and angles in the geometry of space dimensions.

Conclusion; C said that the use of flash animation in math can improve students' mathematical thinking, because of the occurrence of active learning. Flash animation can be used for students to learn by observing, doing, thinking and connecting with all sorts of problems. Flash animations make the students motivated, especially when used to understand difficult concepts in mathematics. Learning with flash animation is very important for students to understand the mathematical problem. From the other side of the conventional learning needs to be done to understand the fundamental and flash animation for learning technology can be used as an aid in the understanding of concepts and to enhance the way students think more effectively (Sudjana). Courseware learning the flash animation has shown a different view to the learning process in the classroom, flash animation is able to analyze the mathematical concepts invent and can provide ideas that connect students with a basic understanding of new knowledge.

## CONCLUSION

This study demonstrates the importance of integration of technology into the learning of mathematics with application of flash animation. The perception of students stated that technology has an important role in learning mathematics. In the perspective of mathematics students need the integration of technology into the learning of mathematics by taking into account pedagogical concepts. Learning mathematics more meaningful construct knowledge by combining three concepts namely content, pedagogical and technological (P. Mishra, 2006). This study shows that many of the benefits of using flash animation. Perceptions of mathematics students showed very beneficial in terms of their experience. It was seen from the view that this animation help students understand math more meaningful, connecting math to the real world, visualization, and understand the importance of mathematics. By looking at concrete examples of abstract concepts that claimant depth understanding of mathematics learning, and by using animation courseware seen as very beneficial (ME Pesonen, 2003).

## REFERENCES

- E. Bukova Güzel, and H. Alkan, (2004) "Sampling of constructivist learning with learning activities developed in mathematics teaching," presented at the 6th National Science and Mathematics Education Conference, Istanbul.
- J. M. Mills. (2003). "A theoretical framework for teaching statistics," *Teaching Statistics*, vol. 25, no.2, pp. 56-58.
- K. B. Smith, and P. G. Shotsberger, (2006). Web-based teacher education: Improving communication and professional knowledge in preservice and inservice teacher training [Online]. [http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content\\_storage\\_01/0000019b/80/19/7c/a1.pdf](http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/19/7c/a1.pdf).
- M. E. Pesonen, (2003). Experiments on using interactive web-based mathematics problem sets based on dynamic geometry applets [Online]. <http://www.joensuu.fi/mathematics/MathDistEdu/Sortavala2003/ArticlePesonen6thConferenceFinal.pdf>
- M. J. Taylor, D. C. Pountney, and M. Baskett, (2008) "Using animation to support the teaching of computer game development techniques," *Computer & Education*. vol. 50, no. 4, pp. 1258-1268.
- M. Niess, (2006). Preparing teachers to teach mathematics with technology [Online]. <http://site.aaec.org/pubs/foresite/MathematicsEd.pdf>.
- McDonalds, . (2005). Using multiple intelligence activities to introduce limits [Online]. <http://www.math.montana.edu/mathed/distance/capstone/mcdonald/index.html>.
- P. Mishra, and M. J. Koehler, , (2006). "Technological Pedagogical Content Knowledge: A new framework for teacher knowledge," *Teachers College Record*, vol. 108, no. 6, pp.1017-1054.
- S. Durmuş, "Constructivist approaches to mathematics education," *Journal of Educational Sciences: Theory & Practice*, vol. 1, no. 1, pp. 91-107, Jun. 2001.
- Sudjana, Nana. *Media Pengajaran*. Bandung: Sinar Baru Algensindo.
- Sugiyono (2010). *Metode Penelitian Pendidikan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- T. Kurz, J. A. Middleton, and H. B. Yanik, "Preservice teachers' conceptions of mathematics-based software," presented at the International Group for the Psychology of Mathematics Education Conference PME-28, Bergin, Norway, July, 14-18, 2004.