

CHAPTER I

INTRODUCTION

A. Background

There is no doubt that the role of science in modern society is changing. It is very different to that of a generation ago. Increasingly the challenges we face as a community be it at the global level such as, dealing with climate change or at the local level such as the problems of an ageing population, of environmental degradation, or of enhancing our economic productivity through science and innovation – all depend on science.

According to Peter (2010) stated that the problem is made even more acute because the nature of science has changed. Rather than dealing with simple systems, increasingly science is dealing with complex issues such as interrelated physical and biological changes in the environment. Science has moved over the last 100 years from being a method that yields certainty and exactitude to a process by which complex systems are studied and modelled and knowledge is expressed in terms of increased probability and reduced uncertainty, but never in terms of absolutes.

A further issue that has been emerged the growth of the internet, which has meant that increasingly the information available to citizens is of an unfiltered nature – it may come from a reliable or an unreliable source, but the reader may not have the skill to as certain the difference. Accordingly, what is seen to be ‘information’ is not necessarily dependable or useful or even safe. Given that the internet is increasingly going to be the way in which people seek knowledge that affects their lives, providing the skills to distinguish reliable from unreliable information is an important part of modern education.

In education, globalization affects on learning process in the schools. It also affects to the technology development in the instructional media which is used in the learning process. However, nowadays still many teacher deliver the content of

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their learning via “chalk-and-talk” method or which is used to conventional teaching method, they do not use media appropriately whereas technologies are available for them to make change in their learning. Commonly, teacher controls the instructional process, the content is delivered in the class and the teacher tends to emphasize factual knowledge. With other word, teacher delivers the content and the students only listen the information from the teacher. Thus, the learning model tends students become passive in their learning process. According to Nitin (2012) stated that the conventional teaching method in classroom has limited effectiveness in the learning process. Some limitations which may prevail in traditional teaching methods are : (1) Teaching in classroom using chalk and talk is “one way flow” of information, (2) Teachers often continuously talk for an hour without knowing students response and feedback, (3) The material presented is only based on lecturer notes and textbooks, (4) Teaching and learning are concentrated on “plug and play” method rather than practical aspects, (5) The handwriting of the lecturer decides the objective of the subject, (6) There is insufficient interaction with students in classroom, (7) More emphasis on theory without any practical in real situation, (8) It is more about memorizing, not understanding.

Chemistry is one of the science subjects in the middle school. Chemistry is about natural phenomena that occur in daily life. The concepts are very important and one that should be noted is how the concept was understood by learners. However, because there are many teachers who use traditional teaching or lecture so the concept is expected to be understood by students are not conveyed properly or is not working as expected. This is because a lot of chemistry concepts are complex, so it should be supported by practical activities or different media. However, not all school are fully equipped science laboratory facilities. In addition, that equipments are generally only able to show symptoms of the macro. As in mixture materials with sub chapter of separation pure substances and mixtures, the mixture of substances should be shown by conducting experiment. Another problem is the efficiency of the time, conducting experiment in the lab

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requires a long time because before conducting experiment teacher must prepare the materials before the class started.

In response to this problem, it is necessary to attempt improvement and innovation in the learning process. One innovation that can solve problems in science learning is teacher needs to make improvements their teaching strategies such as use of computer to deliver materials. Besides that, teacher should place their position as a designer and organizer of learning so that students have the opportunity to understand and interpret science through learning activities. In addition, teachers can make learning and teaching more attractive by using interactive learning media to attract students' motivation in learning science especially in chemistry. Because of that, the role of media is important to make learning process become more interesting and students more curious in science subjects. By choosing the appropriate media will make learning process effectively. An effective learning is a learning process that is not only focused on learner outcomes, but how effective learning process is able to provide a good understanding, intelligence, perseverance, opportunity and quality which can give change behavior and apply it in their lives.

In general educational terms, animations can be viewed as a technique of visualisation. According to Richard and Roxana (2002), animation refers to a simulated motion picture depicting movement of drawn (or simulated) objects. Together with other techniques elaborated as a result of rapidly developing information and communication technologies, use of animations has been strongly encouraged as an innovative, constructivist and students-centred alternative to the traditional learning approaches in many countries (Moreno *et al*, 2001; Neo & Neo, 2009).

The role of video animation as a visual aid is very powerful tool for developing the students concept mastery in separation pure substances and mixtures. The main purpose of this research is to determine the effectiveness of video animation as a visual aid. A total of 55 junior high school students (aged 13

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years) participated in the study. Two classes are chosen. The concept separation of pure substances and mixtures delivered by using video animation to the class. The instruments used in this research: pre-test, video animation, and post-test.

B. Research Problem

Based on the background that have been explained on above, the research problem of this paper is “how is the role of video animation on students concept mastery in title of Separation of Pure Substances and Mixtures?”.

C. Research Questions

Regarding the research problem, two questions can be addressed:

1. Does the use of video animation make an difference in the students concept mastery of separation pure substances and mixtures?
2. At which cognitive level students concept of mastery is more improved in both of group?

D. Research Limitation

In this study, the researcher chose to limit the problems of the using of video animation in chemistry in the concept of pure substances and mixtures. So, that the results can be more focused. Research limitation in this study are :

1. Students' improvement in learning concept of pure substances and mixtures through the video animation.
2. Learning materials and students' mastery of concepts is measured by pretest and posttest question.

E. Research Benefits

The use of audio- visual aids in classroom or other training sessions improves the performance of the students. When a teacher gives maximum exposure along

with different perspectives; using variety of audio-visual aids for particular concept maximum students receives success in comrehending such lecture.

According to James (1959) stated that audio-visual aids are tool or mechanics used to facilitate the learning experience of the individual and to make it more realistic and dynamic. In this research, many benefits should be considered toward the students and teachers:

1. Students

Using a different kind of visual aids such as video animation will improve the students interest in understanding the chemistry concepts.

According to Sampath, Panneerselvam, and Santhan (1998) stated that students more attentive, motivated and interested as compared to that classroom session that is in function without the use of audio-visual aids. In other word, by using visual aids students attention will attracted.

2. Teachers

The use of audio – visual aids in the classroom teachers will deliver the concept easily.

An old Chinese proverb goes like “one picture has more worth then thousand words”. According to Samreen, Sufiana and Malik (2012) “Indeed if teacher uses words along with pictures students are better able to grip the crux of the concept earlier”.

When an audio-visual is practiced by the teacher, there must be some benefits and advantages of using it. Some commonly known pros of using audio-video aids are expressed in opinions of following scholars:

James (1959) stated that helps in comprehension by bringing the child in a direct contact with the concept and how it actually works in real life situations

In the process of science learning, the teacher should therefore incorporate students’ “rich pool of representational competence” in creating lessons so that they are motivating students (Andrea 2004). If we conclude from all of those experts, they suggest to teachers to use a audio-visual aids in classes.

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F. Definition of Terms

Operational definition is important in this research to avoid the misunderstanding between researcher and the reader. There is some explanation below.

1. Video Animation

Video animation have the power to gain the attention of a person for hours together without boring them. And sometimes video animations are extremely helpful in learning process. They help us show and generate interest in something which we otherwise would not entertain.

On the other hand, learning is a pretty complicated process, well for me it's a nightmare when it comes to studies. Now when you analyse the process of learning, "Concentration" will stand out to be the a major criteria for a better learning, followed by "Understanding" and finally "Remembering". All these go hand in hand.

2. PowerPoint Presentation

Presentation is the practice of showing and explaining the content of a topic to an audience or learner. Presentations is also the means of communication which can be adapted to various speaking situation, such as talking to a group, addressing a meeting or briefing a team.

Presentation is a way that used to describe something in the form of PowerPoint that have summarized and packed with interesting visualization. In addition, presentation is an active activity where sources explain and communicate information to the audients. Presentation is created in the form of PowerPoint presentation that contains text, picture, graph, table, and etc. PowerPoint presentation should be able to attract the attention of the audience and have good quality.

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3. Mastery of Concept

Students mastery of concept is a result or a level of ability of students that have been achieved after participating in learning process in the form of changes in behavior skills, and knowledge at certain time then will be measured by using test and assessed into score or statements. In this research, to measured students' mastery of concept by using pretest and posttest. The type of question that used in pretest and posttest is multiple choices.

G. Assumption

Video animations can be viewed as a technique of visualisation. According to Richard and Roxana (2002) "Animation refers to a simulated motion picture depicting movement of drawn (or simulated) objects". Together with other techniques elaborated as a result of rapidly developing information and communication technologies, use of animations has been strongly encouraged as an innovative, constructivist and students-centred alternative to the traditional learning approaches in many countries (Moreno *et al*, 2001; Neo & Neo, 2009).

H. Research Hypothesis

Based on above discussion and background, one hypothesis stated in this research. Which is followed as :

H₀ : There is no significant difference between control and experimental class on the student's mastery of concept in learning the concept of separation of pure substances and mixtures through video animation.

H₁ : There is significant difference between control and experimental class on the student's mastery of concept in learning the concept of separation of pure substances and mixtures through video animation.