

CHAPTER I INTRODUCTION

1.1. Background

Chemistry is one of the hardest subjects for many students especially for senior high school students. The reason for it is the abstract nature of chemistry and the use of several symbols and equations in chemistry. There are many students who reported that they cannot achieve chemistry although they try hard (Kunduz & Secken, 2013). It is why some researches should be conducted to solve the problem in learning chemistry.

From the experience of researcher on field study, chemistry become hard to be understand because student does not interest with chemistry itself. They also do not have any motivation to study about chemistry. This is inversed with some researches that show a connection between student's motivation and interest with learning achievement. Research has shown that intrinsic motivation can be an antecedent to learning and is highly correlated with the academic success of students. The findings of this study provided empirically based insights into what sixth graders found engaging and motivating within a new media environment (Liu, Horton, Olmanson, 2010). The findings also shed some light on the relationship between new media, motivation, and learning. Based on Fauzia students' motivation gives positive effect to students' achievement about 24.5 % and students' interest gives positive effect about 22.2 % to students' achievement on a subject of learning. Based on the research conducted by Sufina, the motivation gives 54.1 % contribution to student's achievement in learning. So, the data show that the student's motivation and interest influence student's achievement, if the motivation is low students' achievement will be low too based on its percentage. Hermaningsih 2010, stated that the use of audio-visual media gives significant different student's achievement compare with print media. So that the researcher recommend a web based learning media to increase student's achievement by increasing their motivation and interest through the media.

Beside chemistry stated as a hardest subject, chemistry is also a central science subject. It is why chemistry should be taught and studied in a special and effective way. Unlike some other disciplines, mostly humanities, chemistry has always required a writing participation. Consider the lecture aspect: while listening to the lecture and/or viewing its slides may be well enough to get the point in history or culture studies, it is quite insufficient to figure out chemistry. If one wants to become really proficient, s/he should repeatedly write chemical symbols, formulas, equations, etc. as s/he sees them either at a lecture or in a textbook – synchronously, and after the lecture or the textbook – asynchronously. Perhaps, neither of eight major subcategories of chemistry knowledge identified by introductory chemistry teachers (chemical language, atomic structure, molecular structure, properties of matter – the chemical structure domain; chemical reactions, kinetics, thermodynamics, and equilibrium – the chemical reactivity domain) can be mastered without student's active writing, and often with instructor's writing participation. When it comes to the laboratory aspect, it is obvious that participation is a key: chemistry proficiency is nothing without analytical / synthetical – manual skills one can develop only by actual participation not merely viewing and listening (Slabin, 2013). So it can be concluded that to teach chemistry there are many aspects that should be mastered by chemistry teacher. The major aspects are the way in teaching and how far teacher understands chemistry itself.

In the aspects of the way of teaching, when teacher faced with the task of learning easy content, instructional design doesn't matter very much. If the content to be learned is difficult, however, then design seems to matter quite a bit. Good teachers can make an enormous difference when the content is difficult (Brooks and Crippen, 2001). So, various teaching way should be implemented based on the characteristics of topic will be taught. Teacher can use various model and method in teaching to make effective learning based on the characteristics of topic. Beside the model and method in learning, learning media also has its own role in learning.

If we talk about the role of media in learning, in the traditional learning environment, it is the teacher who transfers knowledge to the learner through the medium of printed materials, particularly textbooks. There is not much technology usage, and the practice of asking students to collaborate is often lacking (Badeleh & Sheela, 2011). Recently teaching and learning with new information and communication technologies have become of increasing interest (Nick, 1999). The actual growing importance of information and communication technologies is reflected in many areas, including the Chemistry teaching. A powerful tool for obtaining a lot of information is the Internet, which offers a variety of electronic teaching materials: videos, electronic presentations, educational programs, animations, simulations of processes, learning texts, discussion forums, lists of links, etc. These materials, respectively references to them can be grouped in specialized chemical teaching portals (Mrázová and Müller, 2010).

However, the truly Information and Communication Technology (ICT) based learning is a form of education that occurs through the multimedia in class environment; it does not consist of any physical learning materials issued to students or actual face-to-face contact. This type of learning environment has been claimed to promote opportunities for collaborative learning, explorative learning or engaged learning. For example, students will be able to go on an information journey around the world to search for and collect information. In addition to gaining access to databases, networking will enable the students to engage in communications and collaborations with other students, teachers, and people everywhere (Badeleh & Sheela, 2011). It is one of the advantages of teaching and learning using ICT based media. Beside it, the unregulated and unstructured nature of the Web, however, means that users will need to decide which opportunities are appropriate to access, that is, to identify which online courses will optimize their learning experiences (Evans & Leinhardt, 2008). So, there are some advantages of learning chemistry using ICT based media for example web-based learning media.

The advantages that can be got from using ICT in teaching cannot be unconnected with World Wide Web. The World Wide Web provides an excellent environment for interaction between teachers and students. Web-based tele-education environments have become important aspects of the development of domestic and foreign universities. Adaptive learning is applied in this context, to provide a range of instructional environments to suit learners' characteristics or backgrounds, and thus facilitate their learning. The rapid development of the WWW-based network, based on a variety of technologies, is establishing an adaptive learning environment with an infrastructure that is becoming increasingly practical. Therefore, the meaning, content and informational structure of adaptive learning must be clarified to establish a foundation for developing the adaptive learning system (Own, 2010). WWW is a life style for many students now. Almost students have connection with web every time because it is so easy to connect with the web using their mobile phone. So, the development of online learning media is a need because it is parallel with student's life style.

Nowadays, educators in chemistry are using the WWW in a number of ways for the delivery of information. These include the development of specific courses, often replacing traditional lecture courses using WWW-based material. Alternatively, specific resources can be selected by the instructor and used as part of a course. There are many collections of such resources on the WWW, including those which have been independently reviewed. This process gives the instructor confidence in the accuracy and suitability of such materials (Yates, 2000).

Based on the explanation, the research of web-based learning media especially on the chemistry topic of salt hydrolysis is very interesting according to the researcher. Thus, the researcher will conduct a research titled *The Effectiveness of Web-Based Learning Media in Improving Student's Achievement on the Teaching of Salt Hydrolysis*.

1.2. Problem Identification

Based on the explanation in the background, the problems that can be identified are:

- 1) Why does chemistry become difficult to be understood by students and it has been reported that they cannot achieve chemistry although they try hard?
- 2) Student's motivation and interest are still low so that the students' achievement decrease so that how to increase student's motivation and interest should be found.
- 3) Learning process of chemistry still uses traditional environment on it, even though ICT has been growth and becomes student's lifestyle so that how to connected ICT to the learning process in order to make students become more active in learning process.

1.3. Research Scope

The research only investigates the effectiveness of learning media, in this case web-based learning media compared with textbook, so it does not investigate learning model or method. The research investigates student's achievement, student's interest and student's motivation. The topic of teaching is salt hydrolysis taught to grade eleventh of science department at senior high school.

1.4. Research Problems

The problems that were observed are:

- 1) Do the web-based learning media give higher significant difference of student's achievement compared with text book on the teaching of salt hydrolysis?
- 2) Do the web-based learning media give higher significant difference of student's motivation compared with text book on the teaching of salt hydrolysis?

- 3) Do the web-based learning media give higher significant difference of student's interest compared with text book on the teaching of salt hydrolysis?

1.5. Research Objectives

The research objective was to investigate the best media to teach salt hydrolysis. Specific objectives of the study are:

- 1) To investigate the difference of student's achievement in salt hydrolysis by looking student's achievement on solving problems dealing with related chemistry subject after applying web-based learning media compared with textbook.
- 2) To investigate the difference of student's motivation in studying salt hydrolysis after applying web-based learning media compared with textbook.
- 3) To investigate the difference of student's interest in studying salt hydrolysis after applying web-based learning media compared with textbook.

1.6. Research Significance

The benefits expected from this research are explained in the following:

- 1) To get an effective media of teaching that can improve student's achievement in teaching of salt hydrolysis.
- 2) The web made will be a very useful to be used as the learning media because it's really easy to accessed and the contents are complete.
- 3) The result of this research can be used as the teaching media on the teaching of other chemistry topics then will be published so that can be applied in every school that need this media in order to improve student's achievement.

1.7. Operational Definition

To explain some terms of the title, these are some operational definitions:

- 1) Web-based learning media can be defined as a media of learning containing information technology-enabled and supported form of distance learning in which the traditional restrictions of classroom learning have disappeared.
- 2) Discovery learning, in a discovery learning students are encouraged to learn mostly through their own active engagement with the concepts and principles, and teachers encourage students to have the experience and conduct experiments that lets them discover the principles for themselves.
- 3) Student's Achievement is the changing of behavior obtained by students after undergoes learning activities.
- 4) Student's Interest is an individual's relatively enduring psychological predisposition (preference) to re-engage in particular classes of objects, events, or ideas over time and is content specific. In essence, individual interest develops slowly and tends to be long-lasting and is considered to be relatively stable.
- 5) Student's motivation has been defined as the willingness of students to attend and learn material presented in a developmental program. Whereas ability accounts for what individuals can do, motivation to learn influences the decision-making processes determining the direction, focus, and level of effort individuals will apply to a learning activity.