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DEVELOPMENT OF REDUCTION REACTION LEARNING USING COMPUTER BASED LEARNING METHOD

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Abstract

Chemistry is the study of objects, their characteristics, structure, composition, and changes caused by interactions with other objects or chemical reactions. Chemistry is often referred to as the "central science" because it connects various other sciences, such as physics, nanotechnology, biology, pharmacy, medicine, bioinformatics, and geology. A reduction reaction is a chemical reaction that occurs in a redox reaction. The concept of the reduction reaction in redox reactions has undergone several stages of development. For this reason, it is necessary to prepare a learning media that can deliver subject matter that can attract the attention of students to study the material by implementing computer-assisted learning. It is hoped that it can make it easier to understand the reduction reaction material. Computer-Based Learning (CBL) is a computer for presenting learning material that aims to make students more active in learning material in the use of computer media. In its development, Computer Based Learning (CBL) has four learning system models, namely the tutorial model, practice and training models, simulation models, and instruction games models.

Keywords: chemistry, reaction,reduction, CBL

1. INTRODUCTION

A reduction reaction is a chemical reaction that occurs in a redox reaction. The concept of the reduction reaction in redox reactions has undergone several stages of development, namely a reaction that involves an electron releasing event, an oxygen release, and a change in oxidation number. There is a general conception that develops among students which states that chemistry is a difficult and tedious subject because in reality chemistry is only symbolized by elemental symbols that make students feel uninterested in learning it. To change it, there needs to be an improvement in the learning process that can stimulate students' thinking so that chemical concepts can be explored first before bringing up mathematical equations. Students also need to be actively involved in the process so that they can enjoy it and in the end, chemistry can be a fun lesson.[1]–[4]

Teachers sometimes have difficulty delivering material to their students in the classroom. From these materials, the teacher cannot show directly a real picture of how the reduction reaction occurs. Meanwhile, the advantages of the computer-assisted learning process can make it easier for teachers to provide material teaching to students in the classroom where the teacher is not difficult to provide material to students in the form of an unreal image, besides that students can also be more enthusiastic about learning from the uniqueness of the visual display. made and can motivate students to repeat the material that has been studied in school to be studied at home with a computer as a medium for learning. Revolution in the learning method is not abandoning reading or listening habits as has been done so far.[5]–[9]

CBL is fully computerized learning, students face and interact directly with computers. This interaction between computers and students occurs individually and learns independently without the help of the teacher. So in this topic, the appropriate term to use is CBL (Computer Based Learning), which all kinds of student learning are related to learning. [10], [11]Because the word "learning" here is still considered a general term because the term "learning" itself naturally includes situations where computers are used as a learning tool, but not to convey information or teach students (Cutri Sihombing, Learning Application of Excel Functions Using the Computer Based Learning Method,

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2013). Media related to computer technology is one of the right media choices as a medium for learning chemistry about reduction reactions because this computer media will also be an evaluation tool to analyze the increased interest and ability of students in understanding and answering questions related to reduction reactions.[12]–[16]

2. METHOD

The method of data collection was carried out by means of a test, observation, and documentation. The form of the instrument used was in the form of test questions, observation sheets, and learning tools which included the syllabus, lesson plans, and teaching materials. The data analysis used is divided into two stages, namely the initial stage and the final stage. The initial stage analysis includes normality and homogeneity tests which are used to see the initial conditions of the study as a consideration in sampling and test analysis to determine the appropriate questions for use in the pre-test and post-test. The final stage analysis is the analysis of the improvement of learning outcomes. The increase in learning outcomes is measured by the t-test.

The research method used is a quasi-experimental method. This form of experimental design is the development of true experimental design, which is difficult to implement. This design has a control group, but it cannot fully function to control external variables that affect the implementation of the experiment. In other words, there are limitations to the initial measurement of the dependent variable and not all variables can be controlled.

3. RESULTS AND DISCUSSION

Testing is the result of an application that has been designed, as in the following explanation:

1. Main Menu Form

There is main menu information in the reduction reaction learning application which has 6 buttons, namely Tutorial, practice, simulation, game, profile, exit.

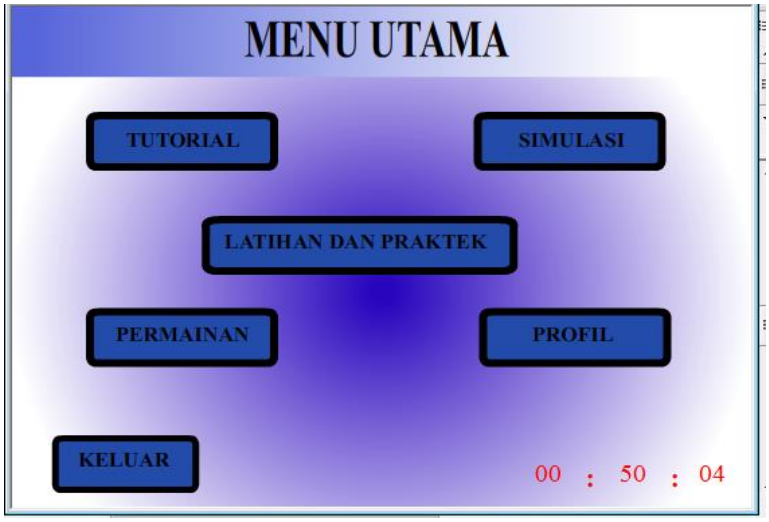

Figure 1: Main Menu Form

2. Tutorial Form

This menu will display information about the description of the learning application material that has been made, the information displayed can be continued by selecting one of the available material selection buttons, as shown below:

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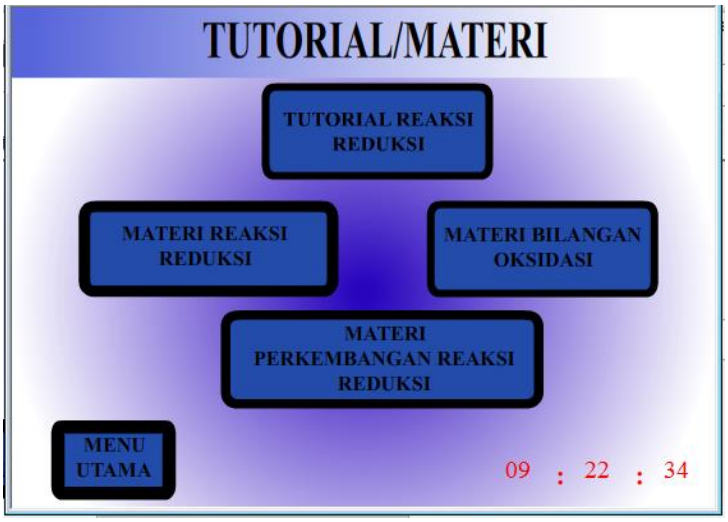

Figure 2: Tutorial Form

In the tutorial menu, there is a redox reaction tutorial button and 3 material selection buttons, namely reduction reaction material, oxidation number, and reduction reaction development. If you select the reduction reaction material button, the reduction reaction material options will appear as shown below:

Figure 3: Reduction Reaction Material selected form

4. CONCLUSION

In presenting this Reduction Reaction material, the application provides material that is easier to understand by students/users who present a multimedia nuance in it. The application of the Computer Based Learning method or computer-based learning can be implemented in the Chemical Reaction learning application, where this application can be used individually and this application starts from tutorials, exercises, and practices, games and simulations. To design this learning application, it is done by designing the display page first then applying it to Macromedia Flash 8 until the final stage can be used by the user.

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