

THERMOCHEMISTRY COMIC AS A SELF LEARNING RESOURCE  
FOR GRADE 11 STUDENTS



A THESIS

Submitted to Faculty of Science and Technology

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SUNAN KALIJAGA  
By  
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*Assalamu'alaikum Wr. Wb.*

Setelah membaca, meneliti, memberikan petunjuk dan mengoreksi serta mengadakan perbaikan seperlunya, maka kami selaku pembimbing berpendapat bahwa skripsi Saudara:

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Dengan ini saya menyatakan bahwa skripsi saya yang berjudul *Thermochemistry Comic as a Self Learning Resource For Grade 11 Students* adalah benar-benar karya saya sendiri. Sepanjang pengetahuan saya tidak terdapat karya atau pendapat yang ditulis atau diterbitkan orang lain kecuali sebagai acuan atau kutipan dengan mengikuti tata penulisan ilmiah yang lazim.

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**Motto**

**There is a will, there is a way**



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**Dedication**

**This thesis is dedicated to:**

**My Almamater, Faculty of Science and Technology of UIN Sunan Kalijaga  
Yogyakarta**



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## ABSTRACT

### THERMOCHEMISTRY COMIC AS A SELF LEARNING RESOURCE FOR GRADE 11 STUDENTS

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Thesis Supervisors :

1. Khamidinal, M.Si.
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This research is a detailed examination of the development of the chemistry educational sources. The purposes of this development research are: (1) to develop a chemistry comic book in thermochemistry chapter, (2) to evaluate quality of the chemistry comic book based on assessment of 3 chemistry teachers and 6 students at senior high school.

The development of this chemistry comic book is guided by thesis supervisors, media expert and peer reviewers. The instrument used to evaluate the quality of this chemistry comic book is a set of quality which has some aspects and criteria. The evaluations included 9 aspects with 38 criteria for teachers and 5 aspects with 27 criteria for students. The evaluation result is in qualitative data and then the result is tabulated and analyzed by the ideal evaluation criteria category guide to measure the quality of a chemistry comic book.

This comic includes 5 sub topics, i.e heat, enthalpy and the change, calculating the change in enthalpy, calorimeter, and fuel. Based on the evaluation converted by 3 chemistry teachers and 6 students, the chemistry comic book developed in this research has a good quality. Based on teachers' assessment, the chemistry comic book has a **good quality**, going the score of 146.33 from the maximum point 190 and ideal percentage 77.02%. Meanwhile, based on students' assessment, it has a **good quality**, going the score of 106.33 from the maximum point 135 and ideal percentage 78.76%. There it can be used as the guideline of the additional study sources.

**Keywords : Chemistry Comic Book, Thermochemistry, Self Learning Resource**

## CHAPTER I INTRODUCTION

### A. Background to the Problem

In implementation of curriculum at school, teacher and headmaster are required to study and get new information about learning system in order to increase the quality of education.<sup>1</sup> Therefore, learning is not only carried out in schools, but also can be implemented at home and around the neighborhood. Learning is not only done during school hours, but it can be done at any time without any time limitation. Thus learning should not be limited by space and time.

To achieve this, one alternative way is to use a textbook which can be accessed at any time. However, this can not be done by most student because their lessons can not interest them to read and explore the content of textbooks. The books which are thick and filled with writings that confusing them are one reason why they do not read it, especially the chemistry books. Responding to this, media are needed as alternative that can attract their interesting in reading and studying chemistry. One of the alternative media that can be developed is a comic. Comic is not something foreign in everyday Mullife, especially for students who are accustomed to watch television. This is what enable comic to can be used as an alternative medium in the study because it is identical to something that does not create tension. Comic is one of the visual media that can be utilized in learning. Reading comic is something commonly encountered in everyday life and it has a high comfort

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<sup>1</sup> Mulyasa. 2008. *Implementasi KTSP*. Jakarta: Bumi Aksara. Page: 13

value, while chemistry is something that commonly encountered in school and is regarded as something abstract and complicated. Two contradictory things can be used as something interesting, fun, and educational. In this research, writer will make a comic by using Doraemon's and his friends' figures because they have been very famous in Indonesia.

### **B. Identification of the Problem**

Based on the background, the identification of the problems in this study are:

1. There is new innovation in developing chemistry learning media in order to facilitate students, but many students still feel difficult in learning chemistry.
2. There are many sources of learning that can be used as self-learning media, but many students are not capable yet to study chemistry autonomously.

### **C. Delimitations of the Problem**

The problem identified in this study can be limited as follows:

1. To develop chemistry comic book in thermochemistry chapter based on standard of content.
2. To assess chemistry comic book's quality by three SMA/MA chemistry teachers and six SMA/MA students.



#### **D. Formulation of the Problem**

Based on the background, the problem that will be examined in this study can be formulated as follows:

1. How do we develop chemistry comic book in thermochemistry chapter?
2. How is the quality of chemistry comic book?

#### **E. Objectives of the Study**

In line with the problem formulation mentioned above, the research objectives are :

1. To develop chemistry comic book for SMA/MA based on a chapter on Thermochemistry.
2. To study the quality of the chemistry comic book developed based on SMA/ MA teachers and students's assessment.

#### **F. Product of the Research**

The product of the research in this study will have the following characteristics:

1. Chemistry comic book for SMA/MA in Thermochemistry chapter.
2. Chemistry comic book presented in the form of the book contains interesting pictures.
3. Chemistry comic book has images that are easy to understand.
4. Chemistry comic book includes problem to help students evaluate their understanding

### **G. Significance of the Study**

Chemistry comic book is considered important because it is expected to:

1. Be a self-learning medium for SMA/MA students of semester 1 at grade XI.
2. Be an alternative source of learning for SMA/MA students.
3. Motivate students to study chemistry.
4. Provide an innovation for the development of research in education.

### **H. Limitations of the Product**

Writer believe that chemistry comic book can be an independent medium in learning for SMA/MA students at grade XI, but this comic has limitations. Limitations of this comic are due to the fact that:

1. Not all concepts in the subject materials can be drawn.
2. Not all chemistry comic book can accommodate the expectation of the students.

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## **CHAPTER V**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **A. Conclusions**

The conclusions that can be driven from the research are as follow:

1. Writer has successfully compiled chemistry comic book in thermochemistry chapter as a self-learning media for SMA/MA students of semester 1 at grade 11. These development procedures consist of four phases: planning, organizing, implementing and assessing.
2. Based on teachers' assessment, the chemistry comic book has a good quality, going the score of 146.33 from the maximum point 190 and ideal percentage 77.02%. Meanwhile, based on students' assessment, it has a good quality, going the score of 106.33 from the maximum point 135 and ideal percentage 78.76%

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## **B. Recommendations for utilizations, dissemination and future product development**

### 1. Recommendations for Utilizations

By the perfection of chemistry comic book, the writer recommended that this comic be used as an alternative self-learning medium for SMA/MA students of semester 1 at grade 11 to know its weakness and strengths.

### 2. Recommendations for Dissemination

This chemistry comic book is suitable to be used as a self-learning media if it is proven experimentally to help the SMA/MA students to get a better understanding on thermo chemistry in their learning process.

### 3. Recommendations for Future Product Development

This chemistry comic book can be used and improved in learning process that involves both students and teachers. Teachers should be more creative in teaching, and students should be more active in learning to get learning experiences.



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