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PROCEEDINGS
INTERNATIONAL CONFERENCE ON EDUCATIONAL
RESEARCH AND INNOVATION 2013 (ICERI 2013)
STRENGTHENING THE TIES BETWEEN EDUCATION AND RESEARCH

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May 16 - 17 , 2013 | UNY Hotel | Yogyakarta State University



2013

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Editor :

Bambang Sugeng, Ph.D
Sumarno, Ph.D
Suharso, M.Pd

Tata Letak :

Ari Setyo Wibowo

Desain Cover :

Pudji Triwibowo

ISBN 978-602-7981-04-1

Perpustakaan Nasional : Katalog dalam Terbitan (KDT)
xi + 464 hlm; 21 x 29 cm

Penerbit:

UNY Press

Kompleks Fak. Teknik UNY, Kampus Karangmalang
Yogyakarta 55281 Phone : (0274) 589346
E-mail : unypress.yogyakarta@gmail.com

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THE EFFECT OF IMPLEMENTATION OF J2ME-BASED MOBILE ENCYCLOPEDIA "CHEMISTCLOPEDIA" AS INDEPENDENT CHEMISTRY LEARNING MEDIA FOR SENIOR HIGH SCHOOL STUDENTS

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ABSTRACT

The improvement of Information Communication Technology (ICT) affects the development of learning media, including chemistry learning media. Mobile chemistry learning media have not been much developed yet unlike the increase of the use of mobile devices in Indonesia. This research aims to measure the effect of the use of Chemistry encyclopedia called Chemistclopedia application to high school students chemistry learning. The Chemistclopedia application is on the topic of chemical elements, and was field-tested on high school students at SMAN 1 Sedayu, Bantul, Yogyakarta. The data about students' learning interest, attitude, motivation, independence, flexibility and style were collected using a set of questionnaire and analyzed using descriptive statistic. This study showed that 87.60% of the students strongly agreed (SA) with the use of *Chemistclopedia* application because it can affect students' learning interest, learning motivation, learning independence, learning flexibility, learning attitude and learning styles of Chemistry.

Keywords: java 2 micro edition (J2ME), chemistry, learning media, Chemistclopedia application.

INTRODUCTION

Backgrounds

The advancement of technology nowadays results in rapid development of learning media, including chemistry media. Learning media on chemistry lesson based on java application and played mobile phone is not much available. In fact, almost all students in secondary high-school have mobile phone that can be used as an potential apparatus for chemistry learning called mobile learning. Mobile learning has been described as having the potential to "reach people who live in remote locations where there are no schools, teachers, or libraries" [1]. In chemistry learning itself many terms in chemistry are not easily memorized and learned by students. Many printed out chemistry encyclopedia have been developed but they are usually thick and not easy to carry.

Therefore chemical encyclopedia called *Chemistlopedia* from which senior high-school students can learn anytime and anywhere should be developed.

This research will study students' responses on the implementation of *Chemist-lopedia* on chemistry learning, measured from their opinion about the changes of learning interest, motivation, independence, flexibility, attitude and styles in Chemistry.

Formulations of Problem

What is the effect of the use of *Chemistlopedia* application to high school students' Chemistry learning based on students' opinion?

DISCUSSION

In this study, 30 students were requested to response toward the use of *Chemistclopedia* their chemistry learning activities.

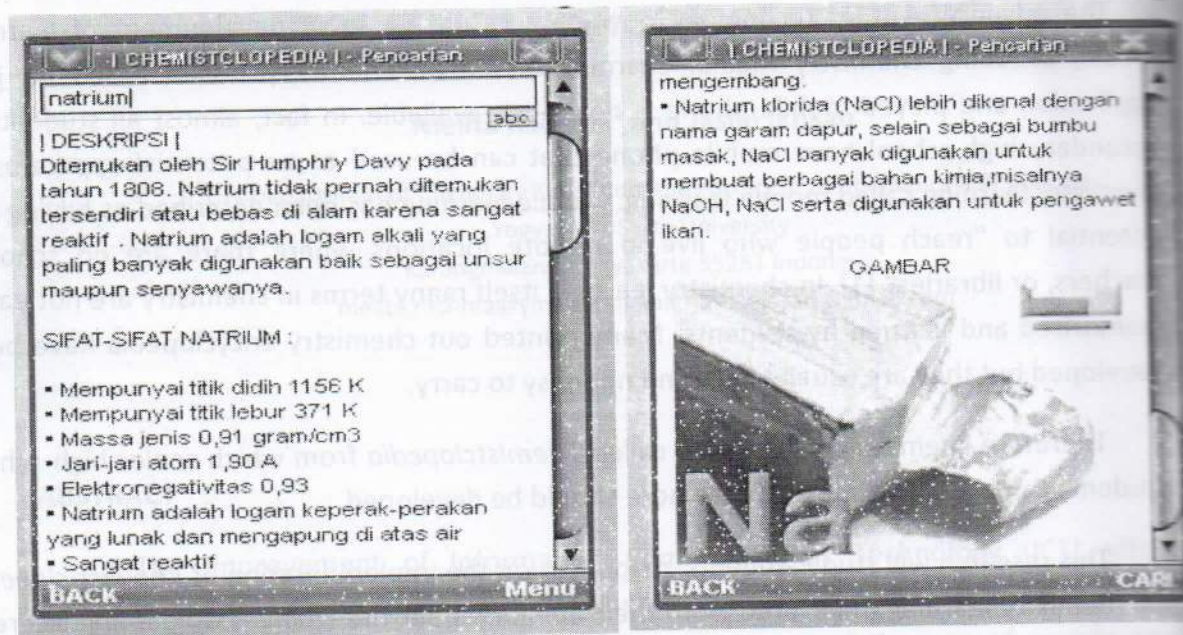


Figure 1. Chemistclopedia Application

The instrument for data collection about students' responses is Lykert scale consisting of 6 indicators: learning interest, motivation, independence, flexibility, attitudes and styles. Each of these indicators consists of some criteria represented by statements for which students have to response based on their own honest feeling. Provided choices of the answer are categorized into strongly agree (SA), agree (A), doubtful (D), disagree (DA) and strongly disagree (SDA). In data analysis, each category are marked by the score of 5 for SA, 4 for A, 3 for D, 2 for DA, and 1 for SDA [2]. Collected quantitative data of students' responses were reconverted into qualitative category of responses by using the equation listed in Table 1.

Keywords: java 2 micro edition (J2ME), chemistry, learning media, Chemistclopedia, mobile application.

Table1.Data Analysis of Students' responses

No	Scorerange	Category
1	$\bar{x} > \bar{x}_i + 1.8 SB_i$	Strongly Agree(SA)
2	$\bar{x}_i + 0.6 SB_i < \bar{x} \leq \bar{x}_i + 1.8 SB_i$	Agree(A)
3	$\bar{x}_i - 0.6 SB_i < \bar{x} \leq \bar{x}_i + 0.6 SB_i$	Doubtful(D)
4	$\bar{x}_i - 1.8 SB_i < \bar{x} \leq \bar{x}_i - 0.6 SB_i$	Disagree (DA)
5	$\bar{x} \leq \bar{x}_i - 1.8 SB_i$	Strongly Disagree(SDA)

Where \bar{x} is mean score and SB is standard deviation. \bar{x}_i is ideal mean score calculated by using equation (1) and SB_i is ideal standard deviation calculated by equation (2).

$$\bar{x}_i = \frac{1}{2} (\text{highest score} + \text{lowest score}) \dots\dots\dots (1)$$

$$M_i = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right) (\text{highest score} - \text{lowest score}) \dots\dots\dots (2)$$

The value of highest score is the number of criteria in respective indicator multiplied by 5 (highest score), whereas the value of lowest score is those multiplied by 1 (lowest score).

The standard value of the category was different for each indicator depending on the number of statements, which was 12.6 for 3 statements and 16.8 for 4 statements as listed in Table 2.

Table 2. The category of students' responses

Indicator	Number of Statements	Mean Score (\bar{X})	Highest Score	Ideals Percentage	Category
Learning interest	3	12.93	15	86.20%	SA ($\bar{X} > 12.6$)
Learning motivation	3	12.90	15	86.00%	SA ($\bar{X} > 12.6$)
Learning independence	4	17.97	20	89.85%	SA ($\bar{X} > 16.8$)
Learning flexibility	3	13.37	15	89.13%	SA ($\bar{X} > 12.6$)
Learning attitudes	4	16.83	20	84.15%	SA ($\bar{X} > 16.8$)
Learning styles	3	13.60	15	90.67%	SA ($\bar{X} > 12.6$)

Overall mean score of students' responses was 87.60, meaning that 87.60% of students strongly agreed that the use of *Chemisclopedia* can affect students' learning interest, motivation, independence, flexibility, attitudes and styles toward chemistry.

From the analysis listed in Table 1, the percentage of students' responses dealing with response category can be shown by Figure 2.

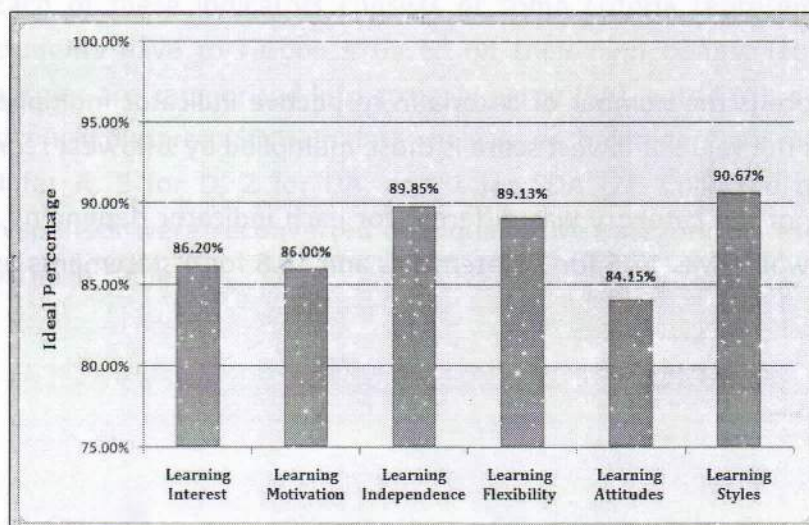


Figure 2. The percentage of Students' Response to each indicator

Effect of Chemisclopedia to students' Learning Interest

The existence of an attractive learning media among senior high-school students is affecting students' interest to the learning process [3], as shown on table 2 above that 86.20% of 30 students were states strongly agreed (SA) *Chemistclopedia* applications can affect their taste of love, a sense of interest and curiosity about chemistry subjects, so that it can increase their interest in chemistry learning.

Effect of Chemisclopedia to students' Learning Motivation

The use of learning media in the learning process can improve students' motivation to increase students' passion to participate in the learning activities and encourage students to achieve the higher learning outcomes . Based on the research [4], the learning media can influence students' learning motivation because learning media can encourage students to be more enthusiastic to learn. That is proved by students' response assessment data shows that 86.00% of 30 students were states strongly agreed (SA).

Effect of Chemisclopedia to students' Learning Independence

Learning media can be used as self-learning source, because by using media learning media student can still learn even without the help from the others and also can define their own learning time such as at their leisure time [5]. Those statements are match with students' response assessment data that shows that 86.00% of 30 students were states strongly agreed (SA) *Chemistclopedia* applications can affect their learning independence.

Effect of Chemisclopedia to students' Learning Flexibility

Based on students' response assessment data shows that 89.13% of 30 students were states strongly agreed (SA) *Chemistclopedia* applications can affect their flexibility in learning chemistry because *Chemistclopedia* applications can be an alternative learning source, so students still can study chemistry even they are not at class.

Effect of Chemisclopedia to students' Learning Attitudes

Learning media can affect students' learning attitude because the existence of learning media, especially *Chemistclopedia* that accessed via mobile phone, students become more creative using his mobile phone, not only used for social media and so on but also can be used for learning. That fact shown on table 2 above that 84.15% of 30 students were states strongly agreed (SA) *Chemistclopedia* applications can influence the change of their learning attitudes.

Effect of Chemisclopedia to students' Learning Styles

Mobile-based learning media can affect students' learning styles because the students always learn more effectively and efficiently using the learning media, the students are not wasted for things that are less important, but can be used to learn, because of that 90.67% of 30 students strongly agreed (SA) that Chemisclopedia applications can influence the change of their learning styles.

CONCLUSION

Based on the discussion, it can be concluded that the use of *Chemisclopedia* application can affect students' learning interest, learning motivation, learning independence, learning flexibility, learning attitudes and learning styles, which were shown by the result of the study that 87.60% of 30 students answered strongly agreed (SA) that mobile application *Chemisclopedia* influences their Chemistry learning.

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