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

May 16 – 17, 2013 | UNY Hotel | Yogyakarta State University
Undang-undang Republik Indonesia Nomor 19 Tahun 2002 tentang Hak Cipta

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Editor:
Bambang Sugeng, Ph.D
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Ari Setyo Wibowo

Desain Cover:
Pudji Triwibowo


Perpustakaan Nasional: Katalog dalam Terbitan (KDT)
xii + 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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FOR SENIOR HIGH SCHOOL STUDENTS

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ABSTRACT

The improvement of Information Communication Technology (ICT) influence
development of learning media, including chemistry learning media. Mobile chemistry
have not been much developed yet unlike the increase of the use of mobile media
Indonesia. This research aims to measure the effect of the use of Chemistry
called Chemistclopedia application to high school students' chemistry learning.
Chemistclopedia application is on the topic of chemical elements, and was field-tested
high school students at SMAN 1 Sedayu, Bantul, Yogyakarta. The data about
learning interest, attitude, motivation, independence, flexibility and style were
using a set of questionnaire and analyzed using descriptive statistic. This study shows
87.60% of the students strongly agreed (SA) with the use of Chemistclopedia
because it can affect students' learning interest, learning motivation, learning
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 Chemistclopedia 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-clopedia 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 Chemistclopedia 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 reconvered into qualitative category of responses by using the equation listed in Table 1.
### Table 1: Data Analysis of Students' responses

<table>
<thead>
<tr>
<th>No</th>
<th>Score Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$\bar{x} &gt; \bar{x}_i + 1.8 \text{SB}_i$</td>
<td>Strongly Agree (SA)</td>
</tr>
<tr>
<td>2</td>
<td>$\bar{x}_i + 0.6 \text{SB}_i &lt; \bar{x} \leq \bar{x}_i + 1.8 \text{SB}_i$</td>
<td>Agree (A)</td>
</tr>
<tr>
<td>3</td>
<td>$\bar{x}_i - 0.6 \text{SB}_i &lt; \bar{x} \leq \bar{x}_i + 0.6 \text{SB}_i$</td>
<td>Doubtful (D)</td>
</tr>
<tr>
<td>4</td>
<td>$\bar{x}_i - 1.8 \text{SB}_i &lt; \bar{x} \leq \bar{x}_i - 0.6 \text{SB}_i$</td>
<td>Disagree (DA)</td>
</tr>
<tr>
<td>5</td>
<td>$\bar{x} \leq \bar{x}_i - 1.8 \text{SB}_i$</td>
<td>Strongly Disagree (SDA)</td>
</tr>
</tbody>
</table>

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

\[
\bar{x}_i = \frac{1}{2} (\text{highest score} + \text{lowest score}) \quad \ldots \ldots \ldots \quad (1)
\]

\[
M_i = \left( \frac{1}{2} \right) \left( \frac{1}{2} \right) (\text{highest score} - \text{lowest score}) \quad \ldots \ldots \ldots \quad (2)
\]

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

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Number of Statements</th>
<th>Mean Score ($\bar{x}$)</th>
<th>Highest Score</th>
<th>Ideals Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning interest</td>
<td>3</td>
<td>12.93</td>
<td>15</td>
<td>86.20%</td>
<td>SA</td>
</tr>
<tr>
<td>Learning motivation</td>
<td>3</td>
<td>12.90</td>
<td>15</td>
<td>86.00%</td>
<td>SA</td>
</tr>
<tr>
<td>Learning independence</td>
<td>4</td>
<td>17.97</td>
<td>20</td>
<td>89.85%</td>
<td>SA</td>
</tr>
<tr>
<td>Learning flexibility</td>
<td>3</td>
<td>13.37</td>
<td>15</td>
<td>89.13%</td>
<td>SA</td>
</tr>
<tr>
<td>Learning attitudes</td>
<td>4</td>
<td>16.83</td>
<td>20</td>
<td>84.15%</td>
<td>SA</td>
</tr>
<tr>
<td>Learning styles</td>
<td>3</td>
<td>13.60</td>
<td>15</td>
<td>90.67%</td>
<td>SA</td>
</tr>
</tbody>
</table>

Overall mean score of students' responses was 87.60, meaning that 87.60% of students strongly agreed that the use of *Chemiscllopedia* can affect students' 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](image.png)

*Effect of Chemiscllopedia 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) Chemisclopedia 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) Chemisclopedia 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) Chemisclopedia applications can affect their flexibility in learning chemistry because Chemisclopedia 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 Chemisclopedia 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) Chemisclopedia 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 learning media always learn more effectively and efficiently using the learning media, then not wasted for things that are less important, but can be used for more important 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 can affect students' learning interest, learning motivation, learning independence, learning flexibility, learning attitudes and learning styles, which were shown by the results of the study that 87.60% of 30 students answered strongly agreed (SA) that mobile applications Chemisclopedia influences their Chemistry learning.

REFERENCES


