

## The Effect of Chemiclife Media on Chemical Bond Material Based on Students Activity and Response

### Pengaruh Media *Chemiclife* pada Materi Ikatan Kimia terhadap Aktivitas dan Respon Peserta Didik

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**Abstrak.** Tujuan dari penelitian ini adalah untuk mendapatkan kepraktisan media *Chemiclife* pada materi ikatan kimia. Penelitian ini menggunakan model 4P (Pendefinisian, Perancangan, Pengembangan dan Penyebaran) modifikasi dari Ibrahim, namun dalam penelitian ini tahap penyebaran tidak dilakukan. Media *Chemiclife* di uji cobakan pada 12 peserta didik kelas XI MIA 2 SMA Negeri 1 Geger Madiun. Instrumen yang digunakan dalam penelitian ini yaitu lembar observasi aktivitas dan respon peserta didik. Kepraktisan media yang ditinjau dari observasi aktivitas memperoleh persentase 100% untuk tiap-tiap aktivitas artinya aktivitas telah terlaksana dengan baik dan respon peserta didik memperoleh rentang persentase antara 83,33% - 100% dengan kriteria sangat praktis.

*Kata-kata kunci: Media Chemiclife, materi ikatan kimia, kepraktisan*

**Abstract.** The aim of the research is to obtain the validity of Chemiclife media on chemical bond material. This research use 4D model (Define, Design, Develop and Disseminate) modified by Ibrahim, for this research the stages of dissemination have not been carried out. Chemiclife Media was tested on 12 students of XI MIA 2 class of Senior High School 1 Geger Madiun. The instrument used in this research was students activity observation and response sheet. The practicality of the media in terms of students activity observation gets percentage of 100% for each activity means that the activity has been carried out properly and the response of students has a percentage range between 83.33% - 100% with highly practice criteria.

*Keywords: Chemiclife media, chemical bond material, practicality*

#### 1. Introduction

The teacher main task is to condition the environment in order to support the occurrence of behavioural changes and the formation of student competencies. For this purpose, it is necessary to condition a conducive environment and challenge the student's curiosity, so that the learning process will take place effectively. The indicator of learning success is marked by the students understanding in the learning process so that teachers are required to be able to create a pleasant learning climate that can lead students understanding maximally [1].

As written in Government Regulation number 32 of 2013 concerning changes of the 2005 Government Regulation on national Education Standards, article 19 paragraph (1) concerning process standards stating that: The learning process in educational units is held in an interactive, inspirational, fun, challenging, motivate students to actively participate, and provide sufficient space for initiatives, creativity, and independence in accordance with the talents, interests and physical and psychological development of students [2].

The use of media is important because in learning process the obscurity of the material presented can be helped by using media as an intermediary. Learning media can represent what the teacher is less able to explain through certain words. Learning media are defined as media that carry information aimed instructional or contain teaching intentions [3]. Based on pre-research result data, 79.4% of students were interested in using comics as learning media. The definition of comics is a form of stories with funny series of images [4]. Comic books provide simple criteria, easily captured and understood. The comic media in the teaching and learning process fosters the student's interest, the teaching and learning process becomes effective, increase interest in learning and generate interest in appreciation. Comic books are media that support the 2013 curriculum implementation which is one form of management and implementation of education aimed to construct the student's potential to become independent human being [5].

One of the chemistry materials is chemical bonds concept which according to the revised 13 syllabus and curriculum is the chemistry subject matter of senior high school X class. Students must understand chemical bonds concept so that it can make students to understand chemical structure concept easily. Because chemical bond is one of the fundamental in the structure learning which is key in chemistry. Chemical bonds explain the relationship between atoms to becomes molecules, ions, crystals and other stable species, but in fact there are still many students have difficulty to understand the material.

Based on the pre-research results conducted in XI MIA 2 grade of Senior High School 1 Geger Madiun, as many as 61.8% of students stated that they were still having difficulties with chemical bonding material. Chemical bonding material was conveyed with the help of book and power points, but as many as 55.9% of students revealed that the books used not yet able to make it easier to understand chemical material. Based on the pre-research results, as many as 52.6% of students stated that the chemical book was dominated by text and chemical formulas so that it was difficult to understand, as many as 31.6% of students stated that chemical book was less interesting or boring and others students argue that chemical book was too monotonous with difficult language and not accompanied by illustrations.

From the explanation above, the researcher took the research to develop comic media as a learning material for chemical bonding material. So, from that the researcher took the research entitled "The Development of Chemiclife Media in the Chemistry Bond Material".

## 2. Methods

Chemiclife media development has been carried out according to the stages of 4D research method. The research stage of 4D are: Define, Design, Develop and Disseminate but in making Chemiclife media will only carried out until develop stage [6]. These stages are described as follows:

### 2.1. Define Stage

The development of 4D begins with design stage, at this stage the researcher can find out the student's problems and get the data through interview with teacher and give a pre-research questionnaire to students.

### 2.2. Design Stage

The second stage is designing Chemiclife media through the following steps: making material summaries, making comic story boards, describing characters in comics, making comic sketches, adding pictures or appropriate illustrations, coloring, adding comic complementary component, designing comic cover and printing Chemiclife media.

### 2.3. Develop Stage

Chemiclife media development stage begins through the guidance process to the lecturer then the result of the guidance and suggestion from the lecturer were used as revised

material to produce draft media I. Draft I that has been obtained then through review stage by chemistry lecturer. After reviewing Chemiclife media it will obtain criticism and suggestions, then it will be used as reference for further improvements to obtain the comic draft II. The next stage is Chemiclife media validation in terms of content validity and construct validity.

The next stage is do limited trial test stage when the media declared valid reviewed from content and construct validity. At this stage get the data of practicability and effectiveness of media that developed. The practicability of media reviewed from the result of 12 students responses as trial subject and also supported by the observation of students activity during the limited trial process. The percentage of students responses and students activities observation were analyzed using the Guttman scale using the following formula:

$$P = \frac{F}{N} \times 100\%$$

Description:

P : Percentage of students responses

F : Frequency of “Yes” or “No” answer

N : Number of respondents

Then, it is interpreted according to what is shown in Table 1. Based on the interpretation criteria of the score, the media can be stated practice if it gets a percentage  $\geq 61\%$  in practice or highly practice criteria.

Table 1. Score Interpretation Criteria

Percentage	Criteria
0% – 20%	Not Practice
21% - 40%	Less Practice
41% - 60%	Practice Enough
61% - 80%	Practice
81% - 100%	Highly Practice

[7]

### 3. Results and Discussion

#### 3.1 Students Activity Observation Result

Students activities observation was carried out by 3 observers, each observer observed the activities of 4 students. The results of student’s activities observation are presented in table 2.

Table 2. The result of student’s activities observation

Nu.	Assesment Aspect	Percentage	Criteria
1.	Students pay attention to the teacher when explaining the material and explain what students will do during learning	100% (Yes)	Highly practice
2.	Students do the pre-test question well	100% (Yes)	Highly Practice
3.	Students show expressions of interest and pleasure with Chemiclife media	100% (Yes)	Highly Practice
4.	Students show an attitude and an enthusiastic expression towards Chemiclife media	100% (Yes)	Highly Practice
5.	Students do “Mari Belajar” question well	100% (Yes)	Highly Practice
6.	Students do the post-test question well	100%	Highly

Nu.	Assesment Aspect	Percentage	Criteria
7.	At the end of the meeting students fill student's responses questionnaire well	(Yes) 100% (Yes)	Practice Highly Practice

Based on table 3, the first activity gets score 100%, meaning that all students pay attention to the teacher when explaining in front of the class. This can be observed from the activities of students who are focused when the teacher explains in front of the class, there is no other activity conduct by them except paying attention to the teacher explanation.

The next activity observed was that the students do the pre-test question well, based on the observer's data the score for this activity was 100%, meaning that all students do the pre-test question well, the definition of "well" in this case is that the students do the pre-test question in an orderly manner, there are no other activities they do and focus on what's in front of them. When students are given a pre-test question sheet, all students work well, relax but still in an orderly condition and when the correction phase there is no question that is not answered by the students.

In the next activity is activities 3 and 4, student's reaction to Chemiclife media. Students showed expression of interest, pleasure and enthusiasm for the Chemiclife media, from the assessment of 3 observers for activities 3 and 4 are getting 100%. Activities 3 and 4 can be observed from the expressions given by students, when Chemiclife media is shared the students immediately open the media, they are interested in reading Chemiclife media and the responses of some students, they hope that the media can be brought home by them. This shows students are interested and enthusiastic with Chemiclife media. Comic can motivate students, help to remember the content of the material and make science learning more interesting. So that comics can increase students learning motivation [8]. Comics in science education in addition to being able to attract student's interest is also effective in convey science knowledge to students with different abilities [9].

The next activity was observed "Mari Belajar" sheet in the Chemiclife media. Based on the assessment of 3 observers, this activity gets a percentage of 100%. The contents of "Mari Belajar" sheet is some evaluation questions that can help recall the story contents in the Chemiclife media. Through 'Mari Belajar' sheet researcher can know students have read the entire contents of the Chemiclife media and prove students are interested and enthusiastic about Chemiclife media. From the "Mari Belajar" sheet correction results, all of the questions have been answered properly and correctly by the students. One of the answers of "Mari Belajar" sheet in the ion bond sub chapter is shown in figure 1.

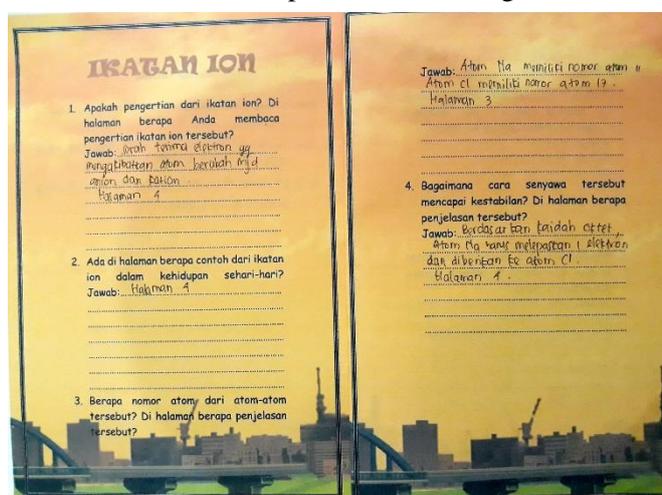


Figure 1. One of student's answer on Mari Belajar

Activity gets a percentage of 100%, meaning that the students do well the post-test question. This activity can be observed from the activities of students while doing the post-test questions, students do in an orderly, relaxed but still serious manner.

The last activity observed by observers is students filled out response questionnaire to the Chemiclife media. The results that gets is used to assess the practicality of the Chemiclife media. The percentage for this activity is 100% it means that students fill out the response questionnaire well and honestly.

Based on observational data on the activities of students, it can be concluded that Chemiclife media on chemical bonding material declared practical in terms of observations of students which get percentage of  $\geq 61\%$ .

### 3.2 Student's Response

At the end of the limited test activity, students fill out the questionnaire responses of students after using Chemiclife media. The result of student's response is presented in the table 3 below.

Table 3. The result of student's responses

Nu.	Assessment Aspect	Percentage	Criteria
1.	Are Chemiclife Media illustrations and writing interesting?	91.67% (Yes)	Highly Practice
2.	Are the illustrations and colors used in the comic less/unattractive?	100% (No)	Highly Practice
3.	Is the flow of material presentation in comics confusing to understand?	83.33% (No)	Highly Practice
4.	Do you feel chemical learning is fun with Chemiclife media?	100% (Yes)	Highly Practice
5.	Is the explanation of material in the Chemiclife media difficult to understand?	91.67% (No)	Highly Practice
6.	Can you understand ionic bond sub material?	100% (Yes)	Highly Practice
7.	Can you understand covalent bond sub material?	100% (Yes)	Highly Practice
8.	Can you understand metal bond sub material?	100% (Yes)	Highly Practice
9.	Is the language used in the Chemiclife media easy to understand?	100% (Yes)	Highly Practice
10.	Is the text contained in Chemiclife media less readable?	91.67% (No)	Highly Practice
11.	Is the language used in Chemiclife media less interesting to read?	100% (No)	Highly Practice

Based on table 3 on question number 1 for the assessment of illustration and writings in the Chemiclife media, get percentage of 91.67% stated interesting. Question number 2, the assessment of image and color illustration in the media gets a percentage of 100% students state image illustrated and colors from Chemiclife media are interesting. In question number 3 about the ease in understanding the flow of material presentation get percentage of 83.33%, students assessed that the flow of material presentation was easy to understand.

For question number 4 about the assessment of Chemiclife media can make learning fun get percentage of 100%, students give an assessment that the media of Chemiclife media can make learning fun. This is reinforced by the validity assessment on the presentation criteria which gets the average percentage in the highly valid criteria. There are three ways that can be done to create a pleasant learning atmosphere that are, friendly presentation, analogy

illustrations and linking with daily life [10]. In the Chemiclife media, the examples given are related to daily life so that students can easier to understand the material. A pleasant and memorable learning atmosphere can attract students to be actively involved so that the learning objectives can be achieved optimally [11].

Comics can convey messages more easily understood. This is because comics combine the power of illustrations and texts that that are arranged in illustrated storylines. Text making comics easier to understand, while illustrated lines make the message convey easier to remember [12]. The role of comics in education more considered because it has ability to tell, convey messages and increase the student's activity and creativity [13].

Interesting and meaningful learning can make information received by students stored in long-term memory. In accordance with the information processing theory that processing information starts from information from external stimuli transmitted to the five senses, in this section there is information that is ignored and there is forwarded to short-term memory. By doing repetition, information on short-term memory will be forwarded to long-term memory and then stored. Information stored on long-term memory will be recalled if needed [14].

Furthermore, for question number 5, the ease of understanding material in the media get percentage of 91.67%, students stated that the explanation of Chemical bonding material is easy to understand. As for question number 6, 7 and 8 regarding the ease of understanding the sub-chapter of ionic, covalent and metal bonding material, each gets an evaluation percentage of 100%. Acquisition of this percentage is supported by the validity assessment for the presentation criteria with the acquisition of the average percentage in the highly valid criteria.

In accordance with 4D media development procedure, in the defining stage curriculum analysis, students, assignments and concepts are carried out so that the material contained in the Chemiclife media can be easily understood b students.

Next, question number 9 about the ease of understanding the language used gets percentage of 100% which shows that language used in media is easy to understand. Question number 10 about the ease of text to read gets percentage of 91.67%, students state that the text is easy to read and for question number 11 get percentage of 100% for attractiveness of the language used in the media. Assessments obtained in number to 10 are supported by the results of the validity assessment on language criteria with acquisition of the average percentage in the highly valid criteria.

From the data of the student's response results described above, Chemiclife media is declared practical with the acquisition of percentage is in the range of 83.33% - 100% with highly practice criteria. Media is declared practical if the percentage obtained was  $\geq 61\%$  [7].

#### 4. Conclusion

Media Chemiclife is declared practical in terms of observing the activities of students and the response of students. The results of observation of students get a percentage of 100% for each activity. The response of students get percentage in the range of 83.33% - 100%. Media is declared practical if the percentage obtained was  $\geq 61\%$ .

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