

**THE ASSESSMENT OF STUDENT'S MIND MAPPING RESULT ON LIMITED TRIAL TOWARDS BILINGUAL INTERACTIVE E-BOOK MEDIA THROUGH MIND MAPPING STRATEGY ON CHEMICAL BONDING MATTER FOR SMA RSBI**

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**Abstract:** The aims of this research is to know the assessment result of student's mind mapping on limited trial towards bilingual interactive e-book media through mind mapping strategy on chemical bonding for RSBI. The assessment was applied to mind mapping's product of 12 students of class XD of SMA Negeri 3 Madiun in a limited trial. The assessment of the mind mapping covers the mind mapping's proportional shape and its content, and also the assessment would done based on the criteria stated in the mind mapping assessment rubric. The mind mapping could be considered as a good one if it obtained  $\geq 2,80$  score based on each assessed criteria's total score.

Out of the entire assessment of mind mapping created by the students, 41,7% was excellent, 41,7% was good, and the remaining 16,6% was fair. From each category of mind mapping. It's figured out that the weaknesses of created mind mapping are the usage of the drawing and material content used. Nevertheless, the percentage of the result proves that created mind mapping has been able to fulfill the good categories in every assessed aspect.

Keyword: Mind Mapping, Limited Trial, E-Book

**Abstrak:** Penelitian ini bertujuan untuk mengetahui penilaian hasil mind mapping siswa pada uji coba terbatas terhadap media e-book interaktif bilingual melalui strategi Mind Mapping pada materi pokok ikatan kimia untuk SMA bertaraf internasional. Penilaian dilakukan pada hasil mind mapping 12 siswa SMA kelas XD SMA Negeri 3 Madiun pada pelaksanaan uji coba terbatas. Penilaian mind mapping yang dilakukan meliputi proporsional bentuk mind mapping dan isi materi, serta dinilai berdasarkan rubrik penilaian mind mapping disesuaikan dengan masing-masing kriteria. Mind mapping dikatakan baik jika mendapatkan kategori nilai  $\geq 2,80$  berdasarkan jumlah skor masing-masing kriteria yang dinilai.

Penilaian mind mapping yang telah dibuat oleh siswa mendapatkan presentase 41,7% dengan kategori sangat baik, 41,7% dengan kategori baik, dan 16,6% dengan kategori cukup baik. Dari masing-masing kategori mind mapping, diketahui bahwa kekurangan mind mapping yang telah dibuat terletak pada penggunaan gambar dan content materi yang digunakan. Namun, hasil presentase membuktikan bahwa mind mapping yang telah dibuat telah mampu memenuhi kategori baik dalam semua aspek yang dinilai.

Kata kunci: Mind Mapping, Uji Coba Terbatas, E-Book

## INTRODUCTION

The development in sector of information and communication technology, nowadays, has brought some impacts toward many aspect in human's life, such as the demand to always innovate or invent new products which will also surely require new skills from human resources. There is also an impact in education sector which is the demand to always improve knowledge in order invent new technology, new concept, and new theory. Those progresses also bring some impact to the learning process at school which eventually will have the teacher to be more creative in teaching the student. There are lots of things that can be done by teachers in their attempt to be more creative and one of them is by creating media to deliver information to the students. The media could be in a form of audio media or visual media or even audio visual media.

Learning is basically a communication process, mainly a process of information delivery from information source to information receiver through certain media. The messages are lessons on the curriculum which are converted into verbal symbol or visual symbol. Communication process itself needs media in order to deliver information to the receiver. The media used is surely a media which can attract students to pay more attention to the lesson, especially, when the lesson itself needs to be explained elaborately such as chemical bonding. One of developable media is a media based on personal communication ability through verbal and its auditory. In other words, this media is built as an

audio-visual media where its content is full of easily memorable and understandable symbols which, we hope, can be something attractive, such as *E-book*.

*E-book* is an electronic book which is full of matter and exercises, run by the students in computer so that the students can directly interact themselves with the matter by choosing some menus which are set up in the *E-book*, and also the students can evaluate themselves by doing some exercise in the *E-book* and the *E-book* will provide them the score of all exercise they have done [1]. This *E-book* hopefully can help students to process the concepts that they have got, until, eventually the concepts will be transferred into long-term memory. Another good way that can be done is by using another strategy which is Mind Mapping strategy. This strategy is suitable with the actual condition where 91,67% of students used Mind Mapping strategy in their learning process. Mind Mapping strategy is an effective note technique by drawing colorized pictures to mapping information. This strategy was developed by Tony Buzan. This is the most effective method and used to develop creative ide [2]. Mind Mapping strategy will be applied in chemical bonding chapter, which match the result of the pre-research inquiry where 45,83% of students consider that the matter is hard to understood. That result is supported by the fact that 91,67% of student haven't used Mind Mapping strategy in chemical bonding chapter. Hopefully, by using Mind Mapping strategy, student can easily to understand more about the matter.

This research will get down to the assessment result of mind

mapping product produced by the students after the limited trial of the developed *E-book*. The limited trial was applied to 12 students, class XD SMA Negeri 3 Madiun, which is one of the international referenced school. The mind mapping produced by the students will be analyzed to find out the strategy's effectiveness which will be used to affect student's activity I understanding chemical bonding. Hopefully, Mind Mapping strategy will be able to help students to understand chemical bonding.

## RESEARCH METHOD

The assessment of student's mind mapping product during the limited trial of bilingual e-book media through Mind Mapping strategy on chemical bonding is based on score criteria of each observed aspect. The final score criteria is obtained from the result filling in assessment sheet of mind mapping. The filling of the assessment sheet is suited to the criteria of mind mapping. There are 6 main criteria in mind mapping where each criteria is complemented with score range that should be given. Those criteria is described in table below:

Table 1 Assessment of Mind Mapping criteria

<b>Proportional of <i>Mind Mapping</i></b>	
<b>Theme's position (main idea) at the middle, written in capital + picture / symbol.</b>	
Score 4	Theme correctly in center of paper, using capital words and supported symbol or picture
Score 3	Tema tepat di tengah kertas, menggunakan huruf balok tanpa simbol pendukung Theme correctly in center of paper, using capital words and without supported symbol
Score 2	Theme not correctly in center of paper, using capital words and supported symbol or picture
Score 1	Theme not correctly in center of paper, using capital words and without supported symbol or picture
<b>Branch's form is thick and long, has different color for each branch and there is a main idea.</b>	
Score 4	The branch is thick and long, colour and shape is different, there is main idea
Score 3	The branch is thick and long, colour and shape is different, there is main idea but the shape of branch is same
Score 2	The branch is thick and long, colour and shape is same, there is main idea
Score 1	The branch is thick and short, colour and shape is same, there is main idea
<b>Twigs / complementary ideas is smaller than the branch 1, completed with keyword (2 words maximum), its length suits the keywords/ picture above it.</b>	
Score 4	Twigs / complementary ideas is smaller than the branch, completed with

<b>Proportional of Mind Mapping</b>	
	keyword, its length suits the keywords/ picture
Score 3	Twigs / complementary ideas is smaller than the branch, completed with keyword, without symbol
Score 2	Twigs / complementary ideas is same with the branch, completed with keyword, its length suits the keywords/ picture
Score 1	Twigs / complementary ideas is same with the branch, completed with keyword, its length doesn't suits the keywords/ picture and without symbol
<b>The color of branch and twig should be matching each other, the writing is tidy</b>	
Score 4	The color of branch and twig is match each other, the writing is tidy
Score 3	The color of branch and twig is match each other, the writing is collide
Score 2	The color of branch and twig is not match each other, the writing is tidy
Score 1	The color of branch and twig is not match each other, the writing is collide
<b>Content</b>	
	Suitability of the material on the branches and twig
Score 4	Suitability of the material on the branches and twig
Score 3	Some of material on the branch and twig is not suitable
Score 2	Almost of material on the branch and twig is not suitable
Score 1	All of material on the branch and twig is not suitable
<b>The material is related to Chemical Bonding</b>	
Score 4	All of material is related
Score 3	Only related with a half of material
Score 2	Only related with some of material
Score 1	Unsuitable with material

Ariyanti [3]

The mean of each filled score on assessment sheet of mind mapping will be analyzed by the following formula:

$$\bar{x} = \frac{\sum x}{n}$$

Sudjana [4]

Where :

$\bar{x}$  = mean of observed aspect score of each student.

$\sum x$  = total of each observed point score.

N = total of observed aspects

Eventually, the mean of each point will be converted into what has been categorized below:

- a. 1,00 – 1,59      Bad
- b. 1,60 – 2,19      Kurang baik
- c. 2,20 – 2,79      Fair
- d. 2,80 – 3,39      Good
- e. 3,40 – 4,00      Very good

## RESULT AND DISCUSSION

Mind mapping assessment result can be seen in the following Table 2:

Table 2 Mind Mapping Assessment Result

Observed Aspect	Student's Score											
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Mind Mapping Proportional Form</b>												
1. Theme's position (main idea) at the middle, written in capital + picture / symbol.	4	4	4	4	4	4	4	4	4	4	4	4
2. Branch's form is thick and long, has different color for each branch and there is a main idea.	2	3	3	2	3	4	3	4	2	4	2	3
3. Twigs / complementary ideas is smaller than the branch 1, completed with keyword (2 words maximum), its length suits the keywords/ picture above it.	4	4	3	4	3	3	3	4	3	3	3	4
4. The color of branch and twig should be matching each other, the writing is tidy.	2	2	2	4	4	4	4	4	4	4	3	4
<b>Content</b>												
1. Suitability of the material on the branches and twig	2	4	3	3	3	3	3	2	2	2	3	4
2. The material is related to Chemical Bonding	3	4	3	3	3	4	4	3	2	3	3	4
<b>Total</b>	<b>15</b>	<b>21</b>	<b>16</b>	<b>20</b>	<b>20</b>	<b>22</b>	<b>21</b>	<b>21</b>	<b>17</b>	<b>20</b>	<b>18</b>	<b>23</b>
<b>Score of Criteria</b>	<b>2,5</b>	<b>3,5</b>	<b>2,7</b>	<b>3,3</b>	<b>3,3</b>	<b>3,7</b>	<b>3,5</b>	<b>3,5</b>	<b>2,8</b>	<b>3,3</b>	<b>3</b>	<b>3,8</b>
<b>Category</b>	<b>CB</b>	<b>SB</b>	<b>CB</b>	<b>B</b>	<b>B</b>	<b>SB</b>	<b>SB</b>	<b>SB</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>SB</b>

Note:

SB : Excellent

B : Good

CB : Fair

Score of criteria and category are categorized based on the assessment above, as shown in Table 3

Table 3 Recapitulation of Mind Mapping Assessment Result

Category	Total	Percentage (%)
Excellent	5	41,7
Good	5	41,7
Fair	2	16,6

The recapitulation of mind mapping assessment results in Table 4 shows that as many as 41,7% of students go to the category of excellent, 41,7% of students in the category of good, and the remaining 16,6% of students get enough category. This suggests that some students have succeeded in making a mind mapping after the use of interactive e-book in accordance with their creativity. The success in making mind mapping is supported by the score data of interactive quiz of students, nearly all of the 12

students who scored satisfactory. Score data of the students are shown in Table 4 as follows:

Table 4 Student Score Result

Student	Score
A	73
B	93
C	73
D	80
E	87
F	87
G	67
H	93
I	80
J	93
K	93
L	60

Furthermore, the following will be describe examples of each mind mapping based on category obtained.

1. Excellent Category

Here's one of mind mapping's result which belongs to Category Excellent, based on the assessed aspects

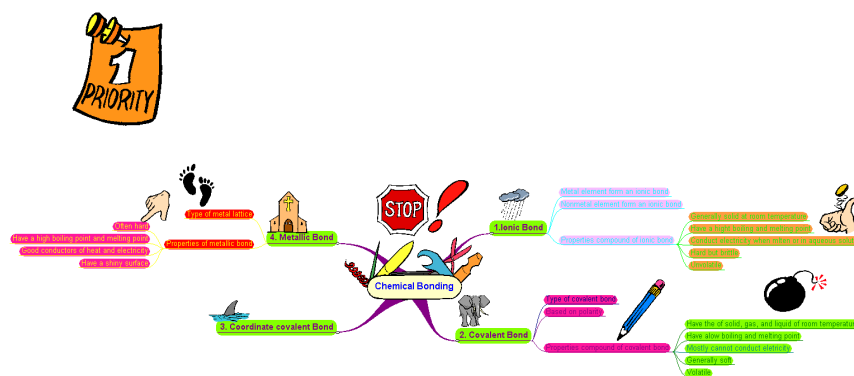


Figure 1 Mind Mapping result which belongs to Category Excellent.

The result of mind mapping above belongs to Category Excellent. This suggests that the mind mapping has been created to meet

the assessed aspects. The assessed aspects include material suitability, color variation, branch liason, layout, and image used. Considered from

material suitability aspect, mind mapping has been created in accordance with the material. This can be seen on the keywords used are related to the chemical bond material and it's been created based on questions on the pre-mind mapping e-book.

Furthermore, the color variations seen clearly in mind mapping, although the color selection was considered inappropriate due to lack of contrast with the text in it. The same goes for the branch used from the central to

the explanatory ideas which also become smaller in its accordance to mind mapping assessment criteria. Worse score is given to the image used, because not all the keywords featured with image and some images are quite not representing the keywords.

## 2. Good Category

Here's one of mind mapping's result which belongs to Category Good, based on the assessed aspects.

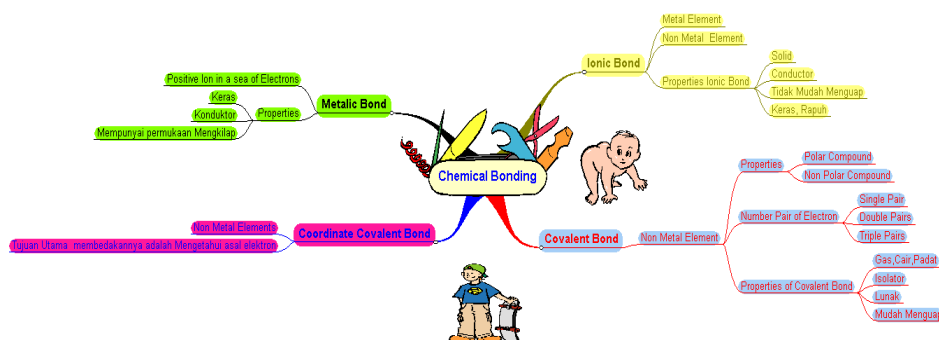


Figure 2 Mind Mapping result which belongs to Category Good.

The results of mind mapping above belongs to Category Good. This suggests that the mind mapping has also been made to meet the assessed aspects. The assessed aspects include the suitability of the material, color variation, branches liaison, layout, and images used. Considered from material suitability aspect, the mind mapping created has not fully suited to material. This can be seen in some keywords used less contain chemical bond, although it's been created based on the pre-mind mapping's questions in the e-book. Furthermore, the color variation is

quite contrast in the mind mapping. The same goes for the branch used from the central to the explanatory ideas which also become smaller in its accordance to mind mapping assessment criteria. Worse score is given to the image used, because not all the keywords featured with image and some images are quite not representing the keywords.

## 3. Fair Category

Here's one of mind mapping's result which belongs to Category Fair, based on the assessed aspects.

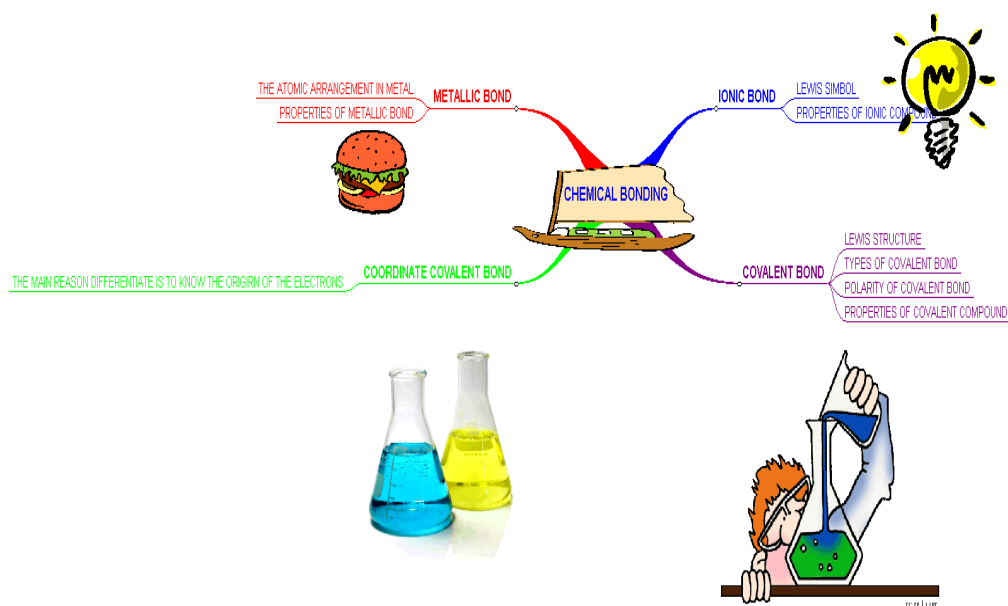


Figure 3 Mind Mapping result which belongs to Category Fair.

The results of mind mapping above belongs to Category Fair. This suggests that the mind mapping created is also quite capable of meeting the assessed aspects. The assessed aspects include the suitability of the material, color variation, branches liaison, layout, and images used. Considered from the aspect of material suitability, mind mapping has not been fully made in accordance with the material. This is seen in some keywords used are less related to chemical bonds, although it has been prepared based on the question pre-mind mapping e-book. Furthermore, the color variation is very contrast in the mind mapping. Furthermore with the use of the central branch to the explanatory words of the smaller, this is in accordance with the assessment criteria mind mapping. Apart from aspects of the suitability of the material, worse score is given on the drawing and layout used in mind mapping, because almost all of

the keywords does not have picture, the picture that is less representative in demonstrating the key word, and its layout is blocking the paper contained in mind mapping.

## CLOSING

Based on the discussion above, can be concluded that student's mind mapping get a excellent category as many as 41,7% , a good category with 41,7%, and the remaining 16,6% get a fair category. From each category of mind mapping show that the weaknesses of mind mapping are made lies on the using of pictures and content of matter. So, needed some development to fulfill with all of the aspect that assessed. Nevertheless, the percentage of the result proves that created mind mapping has been able to fulfill the good categories in every assessed aspect.



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