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Effects of Illustrated Glossary of Plant World Material on Students Creative Thinking Ability

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ABSTRACT

This study aims to look at the effect of pictorial glossaries on the creative thinking abilities of class X students, SMAN 1 Teluk Kuantan on the subject of the Plant World. This type of research was quasi-experimental research. The study population was all high school grade X students as a hypothetical population. The research sample consisted of 67 people consisting of 33 students in class X MIPA 1 as a control class and 34 students in class X MIPA 2 as an experimental class. Data collection techniques used observation sheets. The result shows that average score of the creative thinking ability of the control class students obtained a mean of 64 with a moderate category while the experimental class obtained an average of 74 with a high category. This shows the influence of glossary media in the material world of plants in SMAN 1 Teluk Kuantan with a significant level of 0.05. Thus, there is an influence of the use of pictorial glossaries on the creative thinking abilities of the control class students with the experimental class on plant material in the learning process.

1. Introduction

The aim of 21st century National Education is the importance in realizing the ideals of the nation with various abilities that must be possessed by students, one of which is the ability to think creatively (Ribawati, 2015). This is in accordance with Law No. 20 of 2003 concerning the National Education System as a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential such as being able to think creatively. Dewi et al. (2020) said that education is currently focused on improving higher-order thinking skills such as creative thinking as a form of student creativity in school.

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The process of acquiring the ability to think creatively is usually influenced by the teacher, adequate facilities and infrastructure, as well as input from the students themselves. Students will enhance the ability to think creatively through interactive learning media (Jatmiko, 2015). Furthermore, Fitriani et al. (2020) say that interactive learning media is able to convey more real information in the process of obtaining creative thinking. One of the learning media that supports the process is the use of pictorial glossaries.

Glossary is a plural form of glossary which in a large Indonesian dictionary is defined as a dictionary in a concise form or list of words with an explanation in a particular field (KBBI, 2018). Glossaries as a dictionary can provide information about the meaning of words, spelling, and utterances sought by students for reference sources that contain a list of words with their meanings (Walter in Lew, 2011).

The use of glossaries is inseparable from biological material that contains many important terms as a basic concept for students in the learning process. Jayawardana (2017) through his research on the paradigm of biology learning says that learning biology is difficult for students to understand because there are many Latin terms that relate to basic concepts so that a learning medium is needed as a reference. Therefore, glossary can be interpreted as a medium of input (input) for students in obtaining understanding or concepts in the learning process with the conclusion that the influence of teaching using glossaries causes students to learn more easily (Sari, 2016). Usually, this glossary is placed at the end of a book that contains terms used in the book.

Glossary illustrated material of the plant world as a learning medium has advantages in visual communication because it combines text and images. Fadilah and Mintowati (2015) said that the presence of text and images in a learning medium will be able to have a good impact on students' creative thinking abilities. Furthermore, Chaer (2007) said that pictorial glossaries have a contribution in gaining an understanding for students about the meaning of a term that collects concepts in daily life as part of the creative thinking process.

Creative thinking is the ability to discover new things that did not exist before, are original, develop various new solutions for each problem and involve the ability to generate new, varied, and unique ideas (Leen et al., 2014). Furthermore, Panjaitan et al (2015) said that the ability to think creatively is the ability obtained by students in the form of ideas in tracing the difficulties they face in understanding the concepts being taught through indicators of fluency, flexibility, originality (originality), and detailed (elaboration). Indicators of creative thinking can be obtained by students from the use of pictorial glossary media as a dictionary in general which contains terms and explanations about the concepts of the material being taught (Fadli et al, 2017).

The results of student questionnaires and researcher interviews with teachers in the field of biology studies at SMA Negeri 1 Teluk Kuantan found several problems, namely the low utilization of pictorial glossaries or biological

dictionaries by students in the learning process with a percentage of 47%, causing low creative thinking abilities of students with a percentage of 35% very low category. Based on these problems, supporting media is needed in the learning process in the form of pictorial glossaries that are able to meet the demands of the 2013 curriculum graduates' competency standards, namely improving creative thinking skills. This study aims to determine the effect of pictorial glossary on students' creative thinking abilities.

2. Methodology

This type of research was a quasi-experimental type. This study used two classes, one class as an experimental class and one class as a control class. The research design used a pretest-posttest control group design. According to Sugiyono (2015), the design of the study can consist of two groups chosen randomly. The ability of both groups was measured by pretest before treatment and posttest after treatment. The research site at SMAN 1, Kuantan Bay, was conducted in the even semester from January to May 2019.

The study population used was all students of SMAN 1 Teluk Kuantan in the 2018/2019 Academic Year. The research sample consisted of 67 students in each class consisting of 33 MIPA 1 students and 33 students in class X MIPA 2 students. The sampling technique was done by random sampling. The parameter used in this study is the ability to think creatively by using an observation sheet instrument. Data analysis techniques was by analyzing students creative thinking abilities through the observed aspects. Analysis of the results of filling the observation sheet of creative thinking was done by giving a score to each item statement with the grid in the following Table 1 (Panjaitan et al., 2015).

Table 1. Lattice Observation Sheet for Creative Thinking

| No | Aspect | Number of Statement Items | Item Number |
|----|-------------------|---------------------------|-------------|
| 1 | Think Smoothly | 5 | 1-5 |
| 2 | Think Flexible | 4 | 6-9 |
| 3 | Original thinking | 4 | 10-13 |
| 4 | Detailed Thinking | 4 | 14-17 |

Filling out the observation sheet regarding students creative thinking abilities was based on the stipulated answer score provisions consists of 5 categories (Sugiyono, 2015) with a range of scores in 1-5 in the Table 2.

Table 2. Scoring Answer Observation Sheet for Creative Thinking

| Rating Score | Answer |
|--------------|----------------|
| 5 | Strongly agree |
| 4 | Agree |
| 3 | Quite Agree |
| 2 | Agree Less |
| 1 | Disagree |

Data analysis was performed by determining the average percentage of aspects of creative thinking using the formula: $P = \frac{K}{l \times m} \times 100$. The percentage of the score of the observation sheet of students creative thinking was analyzed with the criteria in the following Table 3 (Riduwan, 2007).

Table 3. Percentage Criteria for Creative Thinking

| Percentage obtained (%) | Information |
|-------------------------|-------------|
| $85 \leq p < 100$ | Very high |
| $70 \leq p < 85$ | High |
| $55 \leq p < 70$ | Is |
| $40 \leq p < 55$ | Low |
| $0 \leq p < 40$ | Very low |

Normality test was done to test whether the data is normally distributed or not. The normality test used the Kolmogorov-Smirnov test with a significance level (α) of 0.05 (Usman, 2006). Withdrawal of normality was done by comparing the value of D_n / sign with Kolmogorov-Smirnov table. Data is said to be normal, if D_n / sig is less than the value of KS-table and if KS-table is greater than D_n / sig , then the data is classified as not normally distributed. Besides that the data can also be compared from the significance value (2 tailed), if the significance value (2 tailed) > 0.05 then the data is normally distributed, and vice versa. Normality test using the help of IBM SPSS Statistics 23 software.

Homogeneity test was done to find out whether the data is homogeneous or not and to determine the control class and the experimental class. Homogeneity variance testing was using the F test with the formula: $F = \frac{\text{Varians Terbesar}}{\text{Varian Terkecil}}$

If $F_{\text{hitung}} < F_{\text{tabel}}$ the data is said to have homogeneous variance. Hypotheses for homogeneity tests are:

H0 = data has homogeneous variance.

H1 = data has non-homogeneous variance.

3. Results and Discussion

Pictorial glossaries as supporting media in enhancing students creative thinking abilities consist of covers, students identities, preface, table of contents, terms accompanied by explanations, pictures, notes, bibliography, and author's history can be seen in Figure 1.

Pictorial glossary is a learning medium that contains information about basic concepts in the material world of plants accompanied by supporting images that are packed with various colors to attract the attention of students as a process of increasing creative thinking abilities. Mutia et al. (2020) say that appropriate learning media such as the use of pictorial glossary media in learning will improve the process of creative thinking in accordance with national education goals.

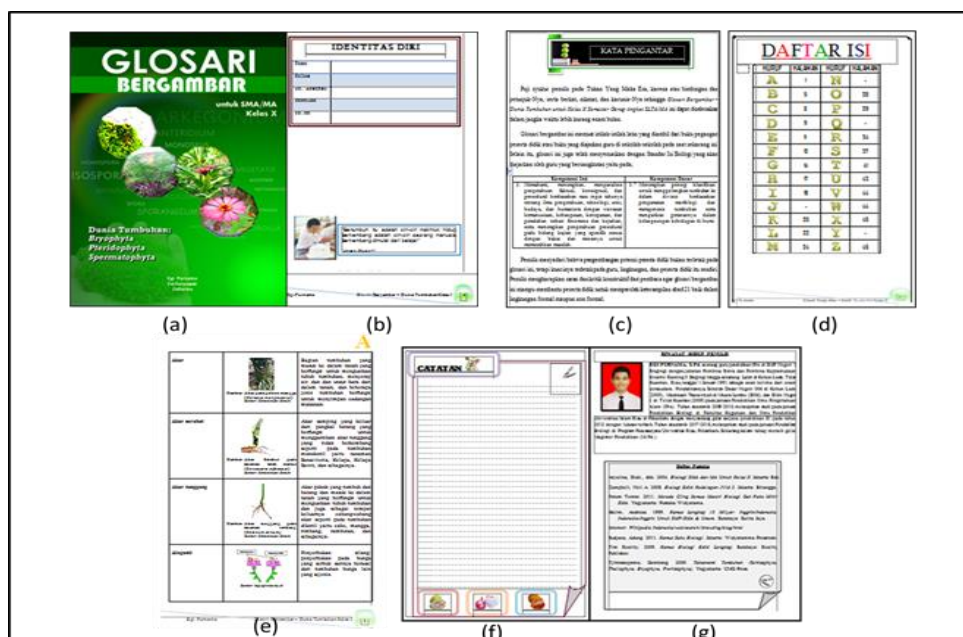


Figure 1. Display Glossary consists of (a) Cover, (b) Student Identity, (c) Preface, (d) Table of Contents, (e) Terms, Images and Explanations, (f) Notes, (g) Bibliography accompanied by Writer's History.

Creative thinking ability is measured through 4 aspects, namely fluency, flexibility, originality and elaboration (Panjaitan et al., 2015). Aspect of smooth thinking consists of 5 statement indicators, flexible thinking with 4 statement indicators, original thinking with 4 statement indicators, and detailed thinking with 4 statement indicators. Assessment of students' creative thinking abilities was conducted 6 times through non-test instruments consisting of 17 statement indicators.

Assessment of the ability to think creatively in the form of non-tests through observation sheets by researchers and observers conducted 6 meetings in KD 3.8 of the plant world with a division of two meetings on each subject matter. Analysis and recapitulation of creative thinking attitudes are accumulated in the diagram form in Figure 2.

Figure 2 shows 4 indicators of creative thinking attitudes in the control class and the experimental class. The highest percentage of control class in the indicator of original thinking is 66% in the medium category and the lowest percentage in the indicator of flexible thinking is 61% in the medium category. This is because students in the control class have been able to think about new problems and ideas but are unable to apply and interpret the concepts of the material being taught because of the lack of appropriate supporting media. Djamarah (2011) said that media or learning resources that are incomplete make presentation in learning become less good and inefficient. This causes difficulties in learning so it is necessary to present the learning media such as pictures and text so as to facilitate students in gaining understanding and learning outcomes. Furthermore, Azhar

(2013) said that the media must be able to assist an effective learning process in accordance with the ability of students.

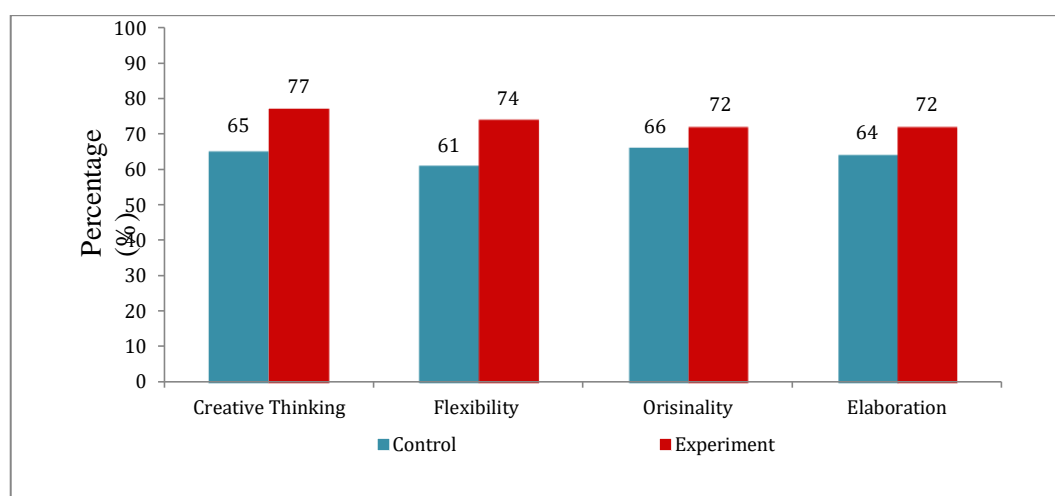


Figure 2. Percentage (%) of Creative Thinking Ability in Control Class and Experimental Class KD 3.7 Plant World Through 4 Aspects of Current Thinking, Flexible, Original, and Detailed

The highest percentage of the experimental class in the indicator of thinking smoothly is 77% high category due to students being able to ask lots of questions, answer, work faster, and be able to see the mistakes of an object or situation in the implementation of the learning process. The lowest percentage on the indicator of original and detailed thinking is 72% due to students still lacking in developing and enriching ideas. Pictorial glossary media in general are able to support the learning process for students in asking lots of questions, answering, working faster, and being able to see the mistakes of an object or situation as part of creative thinking. Nasriyati et al (2017) say that appropriate learning media such as the use of pictorial glossary media will support effective and efficient teaching and learning activities so as to enhance the ability to think creatively.

Hypothesis testing is done to measure students' creative thinking abilities in the control class and the experimental class. Data analysis consisted of a normality test using the Kolmogorov-Smirnov test, a two variance homogeneity test and an independent sample t-test. The normality test results of the value of creative thinking in the control class obtained a significance of 0.071 and the experimental class obtained a significance value of 0.060 which indicates that a significance value > 0.05, which means that the data is normally distributed. Homogeneity test results of two variances in the value of creative thinking in the control class and in the experimental class were obtained $F_{count} = 1.21$ with a value of $F_{table} = 3.14$ for a significance level of 5% meaning $F_{count} < F_{table}$ which means both variances are in a homogeneous state, then proceed with the independent t-test. The test can be seen in the following Table 4.

Table 4. Independent Test t-Test Value of Creative Thinking Control Class and Experiment Class

| N | Df | Sig. | T-Count | T-Table |
|----------|-----------|-------------|----------------|----------------|
| 67 | 65 | 0.000 | 11,69 | 1,997 |

Table 6 shows the significance value (2 tailed) of creative thinking in the control class and the experimental class of $0,000 < 0.05$ otherwise H_0 is rejected and H_1 is accepted. This means that there is a glossary of pictorial material in the plant world on the students' creative thinking abilities. In addition, the value of $t \text{ count} > t \text{ table}$ is obtained $11.69 > 1.99$ which means that H_0 is rejected and H_1 is accepted, which indicates that there are differences in students' creative thinking abilities in the control class and the experimental class after the use of glossary media in the material world of plants in the process. learning.

The difference in thinking ability between the two classes is due to the control class not having supporting media such as glossaries or biology dictionaries in every problem they face either when working on performance such as knowing the concepts and objects under study or when the discussion takes place so as to cause some aspects of the ability to think creatively do not get high score. The experimental class has a high ability to think creatively because each learning activity such as performance and discussion uses supporting media, namely glossaries, so that each problem recognizes an object or concept, they quickly know and understand it. Sudiantini and Shinta (2018) mentioned that creativity or creative thinking cannot arise by itself but need learning that accommodates thinking processes, one of which is by using supportive learning media.

4. Conclusion

Based on the results of data analysis and discussion, it can be concluded that there is an influence of the use of glossary pictorial material of the plant world on the creative thinking abilities of class X high school students with medium categories in the control class and high categories in the experimental class. This shows the creative thinking ability of students who use pictorial glossaries better than students who do not use pictorial glossaries. Suggestions that can be given are the students creative thinking abilities really need to be developed and improved in order to achieve the goals of the 21st century national education. For the next researcher is expected to have a longer research period with a wider population and sample than what researchers are doing now.

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