

## The Effect of Using Mindmaple Applications to Improve Student Learning Outcomes in Islamic Studies Subjects at SMP Negeri 1 Palembang

Ujang Sugara<sup>1</sup>, Heriyah Oktaviani<sup>2</sup>, Rusti Udaina<sup>3</sup>, Mut Yati<sup>4</sup>

<sup>1</sup>SDN 20 Muntok, <sup>2</sup>Sekolah Tinggi Ilmu Tarbiyah Kota Pagaralam, <sup>3</sup>SDN 62 Pagaralam

<sup>4</sup>UIN Raden Fatah Palembang

Email: [ujangsugara@gmail.com](mailto:ujangsugara@gmail.com)<sup>1</sup>, [heriyahoktaviani11@gmail.com](mailto:heriyahoktaviani11@gmail.com)<sup>2</sup>, [rustiudaina01@gmail.com](mailto:rustiudaina01@gmail.com)<sup>3</sup>, [mutyatichan@gmail.com](mailto:mutyatichan@gmail.com)<sup>4</sup>

### Abstrak

Penelitian eksperimen dilakukan di SMP Negeri 1 Palembang. untuk mengetahui tingkat hasil belajar siswa kelas eksperimen dan kelas kontrol sebelum dan setelah penggunaan media *Mind Map* berbantu aplikasi *MindMaple* dalam pembelajaran Pendidikan Agama Islam. Teknik analisis data yang digunakan adalah uji *t Independent-Sample T Test* dan uji *Mann-Whitney* dengan program *Statistical Product and Service Solution* (SPSS). Hasil eksperimen yang peneliti lakukan menunjukkan hasil sebagai berikut: Pertama Berdasarkan hasil eksperimen yang telah dipaparkan pada bab sebelumnya dan analisis data yang telah disajikan, maka dapat diinterpretasikan sebagai berikut. Pada *post-test* hasil belajar kognitif siswa kelas eksperimen dan kelas kontrol diperoleh  $t_{hitung} = ,544$  (Lampiran 9.4). Sedangkan nilai  $t_{tabel}$  untuk  $\alpha = 0,05$  dengan  $df$  55 diperoleh  $t(\frac{1}{2} \alpha, 55) = 2,304$ , berarti  $t_{hitung} < t_{tabel}$  ( $,544 < 2,304$ ), dengan demikian  $H_0$  diterima. Jadi, dapat diinterpretasikan bahwa tidak terdapat perbedaan yang signifikan antara *post-test* hasil belajar kognitif siswa kelas eksperimen dan kelas kontrol. Sedangkan nilai beda rata-rata *post-test* hasil belajar kognitif siswa kelas eksperimen dan kelas kontrol sebesar 0,948. Pada *post-test* hasil belajar afektif siswa kelas eksperimen dan kelas kontrol diperoleh  $t_{hitung} = 3,254$  (Lampiran 9.8). Sedangkan nilai  $t_{tabel}$  untuk  $\alpha = 0,05$  dengan  $df$  55 diperoleh  $t(\frac{1}{2} \alpha, 55) = 2,304$ , berarti  $t_{hitung} > t_{tabel}$  ( $3,254 > 2,304$ ), dengan demikian  $H_0$  ditolak. Jadi, dapat diinterpretasikan bahwa terdapat perbedaan yang signifikan antara *post-test* hasil belajar afektif siswa kelas eksperimen dan kelas kontrol. Sedangkan nilai beda rata-rata *post-test* hasil belajar afektif siswa kelas eksperimen dan kelas kontrol sebesar 5,13. Pada *post-test* hasil belajar psikomotor siswa kelas eksperimen dan kelas kontrol Probabilitas di bawah 0,05 ( $0,089 > 0,05$ ), dengan demikian  $H_0$  diterima. Jadi, dapat diinterpretasikan bahwa tidak terdapat perbedaan yang signifikan antara *post-test* hasil belajar psikomotor siswa kelas eksperimen dan kelas kontrol. Sedangkan nilai beda rata-rata *post-test* hasil belajar psikomotor siswa kelas eksperimen dan kelas kontrol sebesar 3,24.

**Kata Kunci:** Aplikasi *Mindmaple*, Pembelajaran PAI, Hasil Belajar Siswa

### Abstract

Experimental research was conducted at SMP Negeri 1 Palembang. to determine the level of student learning outcomes in the experimental class and control class before and after the use of Mind Map media with the help of the MindMaple application in learning Islamic Religious Education. The data analysis technique used is the Independent-Sample t test and the Mann-Whitney test with the Statistical Product and Service Solution (SPSS) program. The experimental results that the researchers conducted showed the following results: First, based on the experimental results that have been described in the previous chapter and the data analysis that has been presented, it can be interpreted as follows. In the post-test cognitive learning outcomes of the experimental class and control class students obtained a count = ,544 (Appendix 9.4). While the value of t table for = 0.05 with df 55 obtained  $t(\frac{1}{2}, 55) = 2.304$ , meaning  $t_{count} < t_{table}$  ( $,544 < 2.304$ ), thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between the post-test cognitive learning outcomes of students in the experimental class and the control class. Meanwhile, the difference in the average post-test score for students' cognitive learning outcomes in the experimental class and the control class is 0.948. In the post-test affective learning outcomes of the experimental class and control class students obtained t count = 3.254 (Appendix 9.8). While the value of ttable for = 0.05 with df 55

obtained  $t (\frac{1}{2}, 55) = 2.304$ , meaning  $t_{count} > t_{table}$  ( $3.254 > 2.304$ ), thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between post-test affective learning outcomes of experimental class and control class students. While the difference in the average value of post-test effective learning outcomes for students in the experimental class and the control class is 5.13. In the post-test psychomotor learning outcomes of experimental class and control class students, the probability is below 0.05 ( $0.089 > 0.05$ ), thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between the post-test psychomotor learning outcomes of students in the experimental class and the control class. While the difference in the average post-test score for psychomotor learning outcomes for students in the experimental class and the control class is 3.24.

**Keywords:** *Mindmaple Application, Islamic Religious Education Learning, Student Learning Outcomes*

## INTRODUCTION

One way to facilitate PAI learning is to use learning media. Learning media is a message-carrying technology that can be used for learning purposes or the expansion of the teacher (Cepi, 2009:6). As is known, there are many types of learning media. However, one of the innovative learning media that can be used in PAI learning is mind map media. Mind maps are visual forms, aka images, so they are easy to see, imagine, explore, share with others, be presented/discuss, and so on (Windura, 2013:16). Mind maps are an exciting thinking tool, helping us think twice as well, twice as fast, and twice as clearly. With more fun (Buzan, 2007:26), mind maps can be interpreted as a tool of choice to help us sharpen memories. Mind maps can work well because they use the two leading players of our memory, namely imagination and association (Buzan, 2007: 19).

One application that serves to create mind map media is the MindMaple application. In this case, the MindMaple application provides convenience in the form of boxes centered on a central topic which is then repeated or branched into subtopics. In this subtopic, it can still be branched again. And so on, tailored to the needs of the user. The display in the MindMaple application is almost the same as the display in Ms. Words. The difference is in the functions and tools in it. Where Ms.Word is an application used for systematically typing data or information, while the MindMaple application is used to create an exciting mind map to make it easier for someone to learn or solve a topic or problem (Irmasari, 2015:13).

At SMP Negeri 1 Palembang, PAI learning is less attractive to students because teachers' learning media are unsuitable for children's learning needs. Education is also presented mainly by not using a variety of media, so it seems monotonous it makes students bored to learn.

SMP Negeri 1 Palembang was chosen as the research object for several reasons. First, SMP Negeri 1 Palembang is very supportive of mind map media with the help of the MindMaple application because each class has an LCD projector installed and adequate computer laboratory space so that teachers can freely use it to display the media. Second, SMP Negeri 1 Palembang is made one of the leading schools in the city of Palembang. Third, the teachers at SMP Negeri 1 Palembang are still experiencing many difficulties in making the latest technology-based media, especially PAI teachers.

## METHOD

This type of research is descriptive quantitative research. The research method uses experimental research methods in using Mind Map media by comparing learning outcomes in the control class and the practical course. This research was conducted directly by the researcher, so the researcher participated in the learning process during the study. The design in this study uses a Quasi-experimental design, namely quantitative research, but there are no external variables that influence the formation of the dependent variable. So that the independent variable solely affects the results of a study on the dependent variable. This is indicated by the existence of control and treatment variables that are not chosen randomly (Sugioyo, 2008: 116). In this study, using a pre-test and post-test group design, the researcher gave a pre-test to the sample class to determine the initial ability (control group and experimental group). After completing the treatment in both sample classes, a post-test was carried out. Before the value data is tested for difference, the validity analysis is carried out first through normality and homogeneity analysis.

## RESULTS AND DISCUSSION

### Pre-Test Data Analysis

Pre-test data analysis was conducted to test the differences (Sugiono, 2008:223). In this study, namely, the differences in initial learning outcomes between the experimental and control classes. Before analyzing the pre-test data quantitatively, use parametric statistics, namely the Independent Samples T Test, for customarily distributed data, and non-parametric statistics, namely the Two Independent Samples Test (Mann Whitney Test), for testing abnormally distributed data. The collected data were analyzed first by prerequisite test. Prerequisite tests carried out include normality and homogeneity tests using the SPSS program. After the prerequisite test, the hypothesis is tested.

#### ***Pre-Test Student Cognitive Learning Outcomes***

##### **a. Normality Test**

The normality of data is an essential requirement that must be met in parametric analysis. If the information being tested is normally distributed or close to a normal distribution, then with these data, various inferences or decisions can be made using parametric statistical methods. However, if it is proven that the data is not normally distributed or far from the standard distribution criteria, the parametric method cannot be used for inference activities. It is better to use non-parametric statistical methods (Santoso, 2012: 242).

In SPSS, there is also a feature for testing data distribution using the P-P PLOTS and Q-Q PLOTS menus. This menu not only tests whether the data distribution follows the normal distribution (because it is called data normality), the normality test is used to determine whether the data meets the requirements for an analysis test with parametric statistics, namely the t test.

#### ***Pre-Test Normality Test of Experimental Class Students' Cognitive Learning Outcomes***

Pre-test score data. Cognitive learning outcomes of experimental class students were tested for normality using the Q-Q Plot Test in the Statistical Product and Service Solution (SPSS) data processing program. The results of the pre-test normality test of experimental class students' cognitive learning outcomes data are around a straight line. Still, the data variation is minimal, so the data distribution is difficult to meet the normality requirements. So it can be stated that the tested data is not normally distributed.

#### ***Normality Test Pre-Test Cognitive Learning Outcomes of Control Class Students***

Control class students' pre-test value data cognitive learning outcomes were tested for normality using the Q-Q Plot Test. Pre-test normality test results Cognitive learning outcomes of control class students, the data spread close to a straight line or the data spread around a straight line. So it can still be stated that the tested data is usually distributed.

##### **b. Homogeneity Test**

The homogeneity test is a requirement for all differences in hypothesis testing, which is intended to test whether the two samples taken have the same variance. The homogeneity test was carried out with the One Way Anova Homogeneity of Variance Test (Levene Statistics test) in this study.

The results of the data analysis of the homogeneity test of the pre-test cognitive learning outcomes of the experimental class and control class students based on the test results obtained a significance of 0.027. It turned out that the significance value was  $0.027 < 0.05$ . Thus the pre-test data on the cognitive learning outcomes of the experimental class and control class students were declared to be inhomogeneous. So it can be said that the data come from populations that have unequal variances.

##### **c. Hypothesis Testing**

The results of the pre-test hypothesis test of students' cognitive learning outcomes in the experimental and control classes are in the Asymp column. Sig. (2-tailed) or the asymptotic significance for the two-tailed test is 0.046. The probability is less than 0.05 ( $0.046 < 0.05$ ). Thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between the pre-test of students' cognitive learning outcomes in the experimental class and the control class. The cognitive learning outcomes of practical class students who use mind map media differ from the control class students' cognitive learning outcomes who do not use mind map media.

#### ***The Difference Test on the Average Pre-Test of Students' Cognitive Learning Outcomes***

Based on Asymp, Sig. (2-tailed) or the asymptotic significance for the two-tailed test is 0.046. The probability is less than 0.05 ( $0.046 < 0.05$ ). Thus  $H_0$  is rejected. So, it can be interpreted that there is a

difference between the pre-test of students' cognitive learning outcomes in the experimental class and the control class.

The difference between the average pre-test scores of students' cognitive learning outcomes in the experimental and control classes is 5.20. These results were obtained from the average pre-test score for the practical class students' cognitive learning outcomes of 83.70 minus the 78.50 average score for the control class students' cognitive learning outcomes pre-test.

#### ***Pre-Test Student Affective Learning Outcomes***

##### **1. Normality Test**

The normality test on the pre-test of the students' affective learning outcomes includes the pre-test normality test of the students' affective learning outcomes in the experimental class and the control class.

#### ***Normality Test Pre-Test Affective Learning Outcomes of Experimental Class Students***

Pre-test score data The experimental class students' affective learning outcomes were tested for normality using the Q-Q Plot Test. The results of the pre-test normality test The affective learning outcomes of the experimental class students were that some data spread far in a straight line. So it can be stated that the tested data is not normally distributed.

#### ***Normality Test Pre-Test Affective Learning Outcomes of Control Class Students***

Pre-test score data Affective learning outcomes of control class students were tested for normality using the Q-Q Plot Test. The results of the pre-test normality test The effective learning outcomes of the control class students were the data spread close to a straight line or the data spread around a straight line. So it can be stated that the tested data is usually distributed.

##### **2. Homogeneity Test**

The results of the analysis of the homogeneity test of the pre-test of the affective learning outcomes of the experimental class and control class students obtained a significance of 0.213. It turned out that the significance value was  $0.213 > 0.05$ . Thus the pre-test data on the affective learning outcomes of the experimental class and control class students were declared homogeneous. So it can be said that the data come from populations with the same variance.

##### **3. Hypothesis Test**

After the normality and homogeneity tests were carried out, the hypothesis was tested. Because the pre-test data on affective learning outcomes in the control class are normally distributed while the experimental class students are not normally distributed and homogeneous, it is better if the pre-test data on students' affective learning outcomes are processed using a two-sample non-parametric statistical test using the Mann-Whitney test.

The results of the pre-test hypothesis test of students' affective learning outcomes in the experimental class and the control class in the Asymp. Sig. (2-tailed) or asymptotic significance for the two-tailed test is 0.008. The probability is less than 0.05 ( $0.008 < 0.05$ ), thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between the pre-test of students' affective learning outcomes in the experimental class and the control class. the affective learning outcomes of the experimental class students who used the mind map media differed from the control class students' affective learning outcomes that did not use the mind map media.

#### ***The Pre-Test Average Difference Test for Students' Affective Learning Outcomes***

Based on Asymp. Sig. (2-tailed) or asymptotic significance for the two-tailed test is 0.008. The probability is less than 0.05 ( $0.008 < 0.05$ ). Thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between the pre-test of students' cognitive learning outcomes in the experimental class and the control class.

The difference between the average pre-test scores for the students' affective learning outcomes in the experimental class and the control class is 6.11. These results were obtained from the mean pre-test score of the practical class students' affective learning outcomes of 89.41 minus the average pre-test score of control class students' affective learning outcomes of 83.30.

#### ***Pre-Test Student Psychomotor Learning Outcomes***

##### **1. Normality Test**

The normality test on the pre-test of students' psychomotor learning outcomes includes the normality

test of the pre-test of psychomotor learning outcomes of students in the experimental class and the control class.

#### ***Normality Test Pre-Test Psychomotor Learning Outcomes for Experimental Class Students***

Pre-test normality test results in Psychomotor learning outcomes of experimental class students are data around a straight line. Still, the data variation is minimal, so the data distribution is difficult to meet the normality requirements. So it can be stated that the tested data is not normally distributed.

#### ***Normality Test Pre-Test Psychomotor Learning Outcomes of Control Class Students***

The results of the pre-test normality test the control class students' psychomotor learning outcomes are data around a straight line. Still, the data variation is minimal, so the data distribution is difficult to meet the normality requirements. So it can be stated that the tested data is not normally distributed.

### **2. Homogeneity Test**

The results of the analysis of the pre-test homogeneity test data. Psychomotor learning outcomes of experimental class and control class students based on the test results obtained a significance of 0.016. It turned out that the significance value was  $0.016 < 0.05$ , thus the pre-test data on the psychomotor learning outcomes of the experimental class and control class students were declared to be inhomogeneous. So it can be said that the data comes from populations that have unequal variances.

### **3. Hypothesis Testing**

The results of the pre-test hypothesis test of psychomotor learning outcomes for experimental class and control class students are in the Asymp. Sig. (2-tailed) or asymptotic significance for the two-tailed test is 0.001. The probability is less than 0.05 ( $0.001 < 0.05$ ), thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between the pre-test psychomotor learning outcomes of students in the experimental class and the control class. The psychomotor learning outcomes of the experimental class students who used the mind map media were completely different from the control class students' psychomotor learning outcomes who did not use the mind map media.

#### ***The Difference Test on the Average Pre-Test of Students' Psychomotor Learning Outcomes***

Based on Asymp. Sig. (2-tailed) or asymptotic significance for the two-tailed test is 0.001. The probability is less than 0.05 ( $0.001 < 0.05$ ). Thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between the pre-test psychomotor learning outcomes of students in the experimental class and the control class.

The difference between the average pre-test scores for psychomotor learning outcomes for experimental class and control class students is -6.14. These results were obtained from the mean rank of pre-test psychomotor learning outcomes of practical class students of 77.33 minus the mean level of pre-test psychomotor learning outcomes of control class students of 83.47.

#### ***Post-Test Data Analysis***

Before analyzing the post-test data quantitatively, the data collected in this study were analyzed first with a prerequisite test. Prerequisite tests used include the normality test and homogeneity test. Prerequisite test results have cognitive, affective, and psychomotor learning outcomes of experimental class and control class students obtained as follows.

#### ***Post-Test Student Cognitive Learning Outcomes***

##### **a. Normality Test**

The normality test on the post-test of students' cognitive learning outcomes includes the post-test normality test of the student's cognitive learning outcomes in the experimental class and the control class.

#### ***Post-Test Normality Test of Experimental Class Students' Cognitive Learning Outcomes***

The results of the post-test normality test of experimental class students' cognitive learning outcomes were that the data spread close to a straight line or the data spread around a straight line. So it can be stated that the tested data is usually distributed.

#### ***Normality Test Post-Test Cognitive Learning Outcomes of Control Class Students***

The results of the post-test normality test of the control class students' cognitive learning outcomes were that the data spread close to a straight line or the data spread around a straight line. So it can be stated that the tested data is usually distributed.

##### **b. Homogeneity Test**

The analysis of the post-test homogeneity test data for cognitive learning outcomes of experimental class and control class students based on the test results in the table above obtained a significance of 0.889. It turned out that the significance value was  $0.889 > 0.05$ . Thus the post-test data on cognitive learning outcomes of the experimental and control class students were declared homogeneous. So it can be said that the data come from populations with the same variance.

### **c. Hypothesis Testing**

The results of the post-test hypothesis test of the experimental class and control class students' cognitive learning outcomes obtained  $t_{count} = ,544$ . While the value of  $t_{table}$  for  $\alpha = 0.05$  with  $df = 55$  obtained  $t_{(1/2, 55)} = 2.304$ , meaning  $t_{count} < t_{table}$  ( $,544 < 2.304$ ), thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between the post-test cognitive learning outcomes of students in the experimental class and the control class.

#### ***The Post-Test Average Difference Test of Students' Cognitive Learning Outcomes***

Based on the value of  $t_{count}$  being more significant than  $t_{table}$  ( $,544 < 2.304$ ), thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between the post-test cognitive learning outcomes of students in the experimental class and the control class.

The difference between the average post-test scores of students' cognitive learning outcomes in the experimental and control classes can be seen in table 4.32, and the mean difference is 0.948. These results were obtained from the average post-test score for the practical class students' cognitive learning outcomes of 91.15 minus the post-test average score of control class students' cognitive learning outcomes of 90.20.

#### ***Post-Test Student Affective Learning Outcomes***

##### **1. Normality Test**

The normality test in the post-test of the students' affective learning outcomes includes the post-test normality test of the students' affective learning outcomes in the experimental class and the control class.

#### ***Post-Test Normality Test of Experimental Class Students' Affective Learning Outcomes***

Post-test normality test results Affective learning outcomes of experimental class students were data spread close to a straight line or data spread around a straight line. So it can be stated that the tested data is usually distributed.

#### ***Post-Test Normality Test for Control Class Students' Affective Learning Outcomes***

The results of the post-test normality test The affective learning outcomes of the control class students were that the data spread close to a straight line or the data spread around a straight line. So it can be stated that the tested data is normally distributed.

##### **2. Homogeneity Test**

The results of the analysis of the post-test homogeneity test data on the affective learning outcomes of the experimental class and control class students based on the test results in the table above obtained a significance of 0.160. It turned out that the significance value was  $0.160 > 0.05$ . Thus the post-test data on the affective learning outcomes of the experimental class and control class students were declared homogeneous. So it can be said that the data come from populations with the same variance.

##### **3. Hypothesis Test**

The results of the post-test hypothesis test of the experimental class and control class students' affective learning outcomes are the results of the post-test hypothesis test output of the practical course and power class students' affective learning outcomes obtained  $t_{count} = 3.254$ . While the value of  $t_{table}$  for  $\alpha = 0.05$  with  $df = 55$  got  $t_{(1/2, 55)} = 2.304$ , meaning  $t_{count} > t_{table}$  ( $3.254 > 2.304$ ). Thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between the post-test affective learning outcomes of students in the experimental class and the control class.

#### ***Post-Test Average Difference Test for Students' Affective Learning Outcomes***

Based on the price  $t_{count}$  is greater than  $t_{table}$  ( $3.254 > 2.304$ ), it means that  $H_0$  is rejected and  $H_a$  is accepted, or the hypothesis reads that there is a significant difference between the affective learning outcomes of the experimental class students who were taught with mind map media and the control class that was not prepared with mind media folder.

The difference in the average post-test scores for affective learning outcomes for experimental and control class students can be seen in table 4.34, and the mean difference is 5.13. These results were obtained

from the average post-test score of the experimental class students' affective learning outcomes of 92.63 minus the average post-test score of control class students' affective learning outcomes of 87.50.

#### ***Post-Test Student Psychomotor Learning Outcomes***

##### **1. Normality Test**

The results of the post-test normality test of experimental class students' psychomotor learning outcomes are that the data is around a straight line. Still, the data variation is minimal, so the data distribution is difficult to meet the normality requirements. So it can be stated that the tested data is not normally distributed.

#### ***Normality Test Post-Test Psychomotor Learning Outcomes of Control Class Students***

The results of the post-test normality test of the control class students' psychomotor learning outcomes are that the data is around a straight line. Still, the data variation is minimal, so it is challenging to meet the normality requirements. So it can be stated that the tested data is not normally distributed.

##### **2. Homogeneity Test**

The analysis of the post-test homogeneity test data for psychomotor learning outcomes of experimental class and control class students based on the test results in the table above obtained a significance of 0.164. It turned out that the significance value was  $0.164 > 0.05$ . Thus the post-test data on the psychomotor learning outcomes of the experimental and control class students were declared homogeneous. So it can be said that the data come from populations with the same variance.

##### **3. Hypothesis Test**

The results of the post-test hypothesis test of psychomotor learning outcomes for experimental and control class students are in the Asymp. Sig. (2-tailed) or the asymptotic significance for the two-tailed test is 0.089. The probability is below 0.05 ( $0.089 > 0.05$ ). Thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between students' post-test psychomotor learning outcomes in the experimental and control classes.

#### ***Post-Test Average Difference Test for Student Psychomotor Learning Outcomes***

Based on Asymp. Sig. (2-tailed) or the asymptotic significance for the two-tailed test is 0.089. The probability is less than 0.05 ( $0.089 > 0.05$ ). Thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between students' post-test psychomotor learning outcomes in the experimental and control classes.

The difference between the average post-test scores and the psychomotor learning outcomes of experimental and control class students is 3.24. These results were obtained from the mean rank post-test psychomotor learning outcomes of students in the practical class of 95.07 minus the mean rank post-test of psychomotor learning outcomes of students in the control class of 91.83.

#### **CONCLUSION**

Based on the experimental results that have been described previously and the data analysis that has been presented, it can be interpreted as follows:

1. In the post-test, the student's cognitive learning outcomes in the experimental and control classes were obtained  $t_{count} = ,544$  (Appendix 9.4). While the value of  $t$  table for  $\alpha = 0.05$  with  $df = 55$  got  $t_{table} (\frac{1}{2}, 55) = 2.304$ , meaning  $t_{count} < t_{table}$  ( $,544 < 2.304$ ), thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between the post-test cognitive learning outcomes of students in the experimental class and the control class. Meanwhile, the difference in the average post-test score for students' cognitive learning outcomes in the practical course and the control class is 0.948.
2. In the post-test affective learning outcomes of the experimental class and control class, students obtained  $t_{count} = 3.254$  (Appendix 9.8). While the value of  $t$  table for  $\alpha = 0.05$  with  $df = 55$  got  $t_{table} (\frac{1}{2}, 55) = 2.304$ , meaning  $t_{count} > t_{table}$  ( $3.254 > 2.304$ ). Thus  $H_0$  is rejected. So, it can be interpreted that there is a significant difference between post-test affective learning outcomes of experimental class and control class students. At the same time, the difference in the average value of post-test effective learning outcomes for students in the practical class and the control class is 5.13.

3. In the post-test psychomotor learning outcomes of experimental class and control class students, the probability is below 0.05 ( $0.089 > 0.05$ ). Thus  $H_0$  is accepted. So, it can be interpreted that there is no significant difference between students' post-test psychomotor learning outcomes in the experimental and control classes. At the same time, the difference in the average post-test score for psychomotor learning outcomes for students in the practical course and the control class is 3.24.

## BIBLIOGRAPHY

- Azhar, Arsyad. (2012). *Media Pembelajaran*. Jakarta: Raja Grafindo Persada.
- Buzan, Tony. (2007). *Buku Pintar Mind Map*. Jakarta: Gramedia Pustaka Utama. Alih Bahasa Oleh Susi Purwoko.
- Falahudin, Iwan. (2014). *Pemanfaatan Media dalam Pembelajaran*. Jurnal Lingkar Widya Swara Edisi 1 No. 4.
- Fatmawati, Sri. dkk, (2015). *Desain Laboratorium Skala Mini untuk Pembelajaran Sains Terpadu*. Yogyakarta: Deepublish.
- Firman, A dan Asto B, I Gusti Putu. (2015). *Pengembangan Media Pembelajaran Mind Map Terhadap Hasil Belajar Siswa pada Mata Pelajaran Teknik Elektronika Dasar di SMK Negeri 2 Bojonegoro*. Jurnal Pendidikan Teknik Elektro. Volume 04. Nomor 01.
- Hawadi, Reni Akbar. (2001). *Psikologi Perkembangan Anak Mengenal Sifat, Bakat, dan Kemampuan anak*. Jakarta: Grasindo.
- Irmasari, Ade, dkk. (2015). *Cerdas dengan Mind Mapping*. Semarang.
- Miarso, Yusufhadi. (2004). *Menyemai Benih Teknologi Pendidikan*. Jakarta: Prenada Media dan Pustekkom Diknas.
- Mustaqim. (2010). *Psikologi Pendidikan..* Jakarta: Rineka Cipta
- Purwanto. (2011). *Evaluasi Hasil Belajar*. Yogyakarta: Pustaka Pelajar.
- Rahayu, Sri. (2012). *Designed Student-Centered Instruction (Dsci): Model Pembelajaran Berbasis Konstruktivistik, Inkuiri Dan Kontekstual*. Makalah pada Seminar Nasional Kimia dan Pendidikan Kimia di FKIP UNS, Semarang.
- Rudi & Cepi, (2009). *Media Pembelajaran*. Bandung: Wacana Prima.
- Santoso, Singgih. (2012). *Aplikasi SPSS pada Statistik Nonparametrik*. Jakarta: Elex Media Komputindo.
- Sri Adelila S., Halimatun S. (2016). *The Development of Mind Mapping Media in Flood Material using ADDIE Model*. Journal of Education and Learning. Vol. 10 (1).
- Sugiyono. (2008). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Sugihartono. dkk. (2007). *Psikologi Pendidikan*. Yogyakarta: UNY Press.
- Suryabrat, Sumadi. (2002). *Psikologi Pendidikan*. Jakarta: PT RajaGrafindo Persada.
- Sutrisno. (2011). *Problem Based Learning Sebagai Suatu Strategi Pembelajaran Untuk Menumbuh-Kembangkan Atmosfer Kebebasan Intelektual*. Jurnal Quantum. Vol.2, No.1.
- Syah, Muhibbin. (2003). *Psikologi Belajar*. Jakarta : PT RajaGrafindo Persada.
- Windura, Sutanto. (2013). *Mind map Teknik Berpikir & Belajar sesuai cara Kerja Alami Otak*. Jakarta. Gramedia.