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Retention Of Middle School Student In Study Material On Classification Of Living Beings Reviewed From The Use Of Sscs Models And Self Efficacy

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Abstract

Indications of difficulties in the learning process can be observed from low learning outcomes. Low learning outcomes usually occur in difficult material such as material classification of living things. One of the things that affects the low learning outcomes is the student's retention ability. Students' retention abilities can be improved by applying the Search, Solve, Create and Share learning models and measuring students' self-efficacy levels. The research method used was a quasi-experimental 2 x 2 factorial design. The instruments used in this study were student self efficacy questionnaires and multiple choice forms of learning outcomes. The research subjects were seventh grade students of Citra Nusa Middle School, totaling 120 students. Sampling by simple random sampling. Data were analyzed using two-way anava test at $\alpha = 0.05$. The results of the study show that: 1). There is the influence of the SSCS learning model assisted by the power point and package books on student retention in the material classification of living things. 2) There is the effect of self-efficacy on student retention in the material classification of living things. 3). There is no interaction between SSCS learning models assisted by power point and package books with self-efficacy in influencing student retention in the material classification of living things. The SSCS learning models assisted by power point and package books and also self efficacy both influence student retention even though they do not interact with each other.

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1. Bagroud of Study

One of the difficult biological science subject materials at the junior high level, based on the results of interviews that have been conducted with teachers, there is the concept of classification of living things. This material is considered difficult because it contains many theories and concepts that make students have to know the scientific names of each species of living things that sometimes have never been encountered in everyday life. In this material also students are required to understand how to classify living things correctly according to certain rules.

This is reinforced by a preliminary study conducted by Insani (2016) which states that the classification of living things is difficult to understand because it contains concepts that are not easily visualized as a whole. The use of Latin according to the scientific system of species is generally difficult for students to memorize, as well as understanding and applying key concepts of determination are things that are not easy for students to do.

Preliminary research conducted by Insani (2016) also revealed that as many as 27% of natural science teachers still had many difficulties in mastering the concept of the classification of living things and generally 30% of teachers only taught it by lecturing. This is in accordance with research Sezek (2013) which states according to the teacher, taxonomy in the classification of living things is not only one of the most difficult topics to teach but also not popular for students.

According to the experience of Citra Nusa Middle School science teacher, if viewed from the majority of the average test scores obtained by each student on this material, generally only a few students can exceed the KKM. The average test scores obtained are part of the assessment of cognitive domain learning outcomes. If the test scores obtained are low, the acquisition of learning outcomes can also be low.

Baharudin (2009) explains the low learning outcomes are an indication of difficulties in the learning process, thus affecting student understanding. Difficulties felt by students in accordance with Yangin, Sidekli & Gokbulut (2014) research stated that primary and secondary school students have problems understanding material classification and diversity of living organisms.

Understanding problems experienced by students can be influenced by the ability to retention or the ability of students' memory. As stated by Makmun (2005) about internal factors that influence student learning difficulties, namely: intellectual ability, affective, interest, motivation, learning maturity, learning habits, ability to remember and the ability of senses. Juniarsih, et al., (2015) also stated that retention (memory) can be used as an indicator of the quality of learning outcomes and the learning process.

The ability to remember is related to memory. Memory according to Shah (2010) comes from the permanent effect of an experience stored in the form of information and knowledge in the structure of the human brain. The retention of each student can be influenced by the use of the five senses as well. Understanding a concept and remembering what is read, heard and seen will be increasingly attached, if students can explain a concept because it is directly involved in an activity or investigation.

One learning model that can be used to improve student retention in science subjects especially this classification material is to use the Search, Solve, Create and Share (SSCS) model. Suciati (2013) explained that the SSCS model was developed by Pizzni & Shepardson in 1987. Chen (2013) explained that the problem solving step using this model, started in

investigating the problem (in the search phase), planning for problem solving (in the solve phase). The next stage constructs problem solving (create phase) and then communicates the problem solving that has been solved (the share phase).

The existence of stages that are continuous and mutually influential in this model makes the learning process more organized, so that it will improve students' ability to remember material. This is reinforced by Gomulya's research (2015) which explains by forming their own questions in the SSCS model, one understands and remembers the information provided. Then the SSCS model is considered to be able to influence student retention.

Through this SSCS model students can learn cooperatively with their friends. According to Felder & Brent (2007) the performance of each student can excel when the application of cooperative learning is done in the classroom. The intended performance results include retention, acceptance of knowledge, accuracy, creativity when solving a problem, and a higher level of reasoning in students. This is in accordance with the statement of Moraga & Rahn (2007) that, cooperative learning is able to encourage students to learn more deeply so that retention can be increased.

The application of learning models in class generally utilizes assistance in the form of textbooks or textbooks and also power points. The use of power points and textbooks in addition to making the learning process easier to do, can also arouse students' desire to learn. This is in accordance with the statement of Asnawir (2002) that the use of media such as power points can increase interest and motivation to learn because it can concrete things from abstracts that are generally unknown to the audience. Mulyatun's research (2012) also states that the use of power points as a learning medium can facilitate students in remembering and understanding material concepts, this is characterized by the speed of mastery of concepts and longer retention of students. The use of textbooks in the implementation of the learning process also has an important role. This is consistent with Ningsih's (2015) research which states that the use of textbooks has a dominant effect on improving student learning achievement in class.

Affective or attitude is an internal factor that can also affect students' understanding problems. Part of the affective that wants to be explored in this study is about student self-confidence. According to Matsumoto & Obana (2001) self-efficacy (self-confidence) is one aspect that serves to build one's confidence. Self efficacy can make students study hard and this is important for more realistic expectations of an outcome. In accordance with the statement of Stankov, et al., (2011) that self efficacy is one of the factors that has a good effect on student academic performance. Hannula, Maijala & Pehkonen (2004) revealed that self efficacy has a remarkable relationship with students' success in learning. Based on this description, there are several things that might affect the retention of students, namely the use of learning models accompanied by the help of power points and textbooks and the efficacy of students. This research was conducted in order to obtain more competitive information about the factors that influence student retention, especially in the classification of living things in terms of the use of learning models and self-efficacy.

2. Research Design and Methodology

This study used a quasi-experimental method, which was conducted at Citra Nusa Cibinong Middle School. Research time in odd semester 2018-2019 school year. The target population in this study was the whole class VII, while the research sample was students of class VII A to class VII D. The determination of the experimental and control class groups was carried out by means of simple random sampling, the control class and experiment groups in this study used the same learning model namely Search, Solve, Create and Share (SSCS) models, which are distinguished by learning aid tools, which are power points and textbooks as well as high and low self-efficacy.

Data analysis was performed both descriptively and inferentially. Descriptive analysis

includes the maximum value, minimum value, median, mode and standard deviation of all data obtained. Inferential analysis was performed to test the hypothesis using the research hypothesis test using the two-way ANAVA test.

3. Result

3.1. Student Retention

a. Comparison of Posttest Average and Research Group Retest Scores

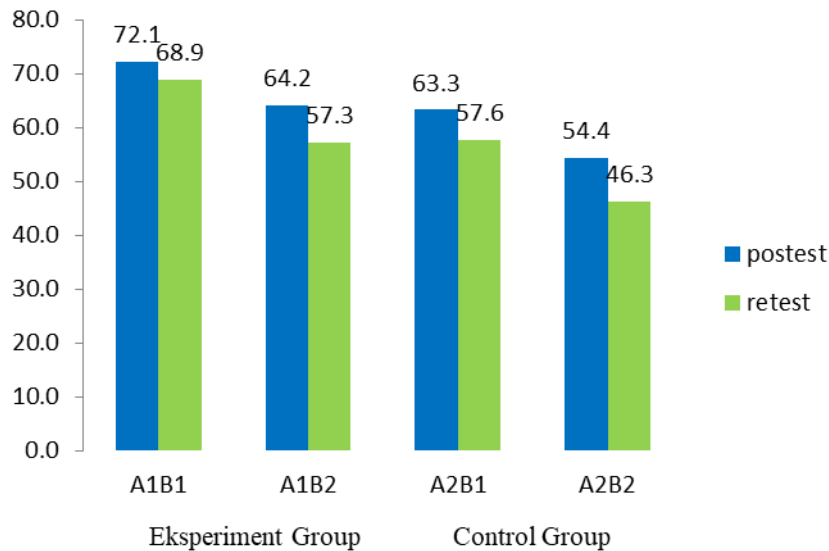


Figure `1. Comparison of Posttest and Retest Average Score in the Research Group

The histogram figure of the average posttest and retest score shows that the group using the power point assisted SSCS model has a higher score, compared to the posttest and retest value of the control group using the package book assisted SSCS model.

b. Study Group Retention Average Score

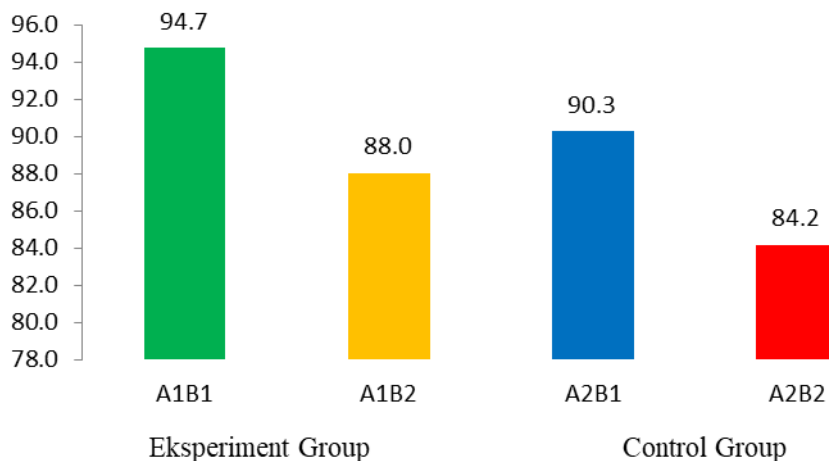


Figure 2. Comparison of Research Group Average Retention Scores

It can be seen from Figure 2 that the A1B1 group that uses the SSCS model assisted by power point (PPT) and has high self-efficacy has a better average score of 94.7 when compared to the other groups.

3.2 Data Retention Scores and Efficacy Scores of the Research Group

Calculations carried out in this study, obtained data descriptions that include: the highest and lowest scores, standard deviations, medians and averages. The details of the scores obtained can be seen in the following table:

Table 1. Retention Scores and Efficacy Scores of the Research Group

Group	Score		Standar Deviation	Median	average
	highest	lows			
A1 (sscs powerpoint model)	103	70	7.57	94.42	91.37
A2 (sscs model package book)	100	75	6.74	86.88	87.21
B1 high self efficacy	164	141	5.86	153.00	152.81
B2 low self efficacy	130	95	9.06	114.50	113.66
A1B1 (SSCS Powerpoint+ high self efficacy)	103	86	4.78	94.81	94.75
A1B2 (SSCS Powerpoint + low self efficacy)	100	69.77	8.45	87.72	87.99
A2B1 (SSCS package book + high self efficacy)	100	81	5.30	88.76	90.26
A2B2 (SSCS package book + low self efficacy)	96.25	75	6.77	82.46	84.16

Generally the score for the acquisition of groups using power point assistance is higher than those using textbooks. Students who have high self-efficacy in the A1B1 and A2B2 groups in the implementation of learning in the classroom using different aids namely power points and textbooks, but it turns out the retention scores obtained are as good as: 94.75 and 90.26.

3.3 Data Analysis Prerequisite Test Results

Data analysis prerequisite test is performed to find out whether the data analyzed for hypothesis testing can be used or not. The data analysis prerequisite test used is normality and homogeneity test. Testing the normality of the results of the data obtained a significance value (p) 0.200 which is greater than the alpha value (α) 0.05 means that the data is normally distributed. Calculation of homogeneity of variance in all four data groups, carried out with the help of the levene test at SPSS 22. The test results show, sig. or p value 0.118 is greater than the value of α 0.05. That is, Hypothesis Ho is accepted, it can be concluded that the tested data come from samples with homogeneous data variance.

3.4 Hypothesis Test Results

Hypothesis testing of data regarding student retention scores using media-assisted SSCS models is distinguished by high and low self-efficacy. Anova two-way hypothesis testing on this data is done with the help of SPSS 22 with a significance level of 5%. Anava 2 calculation results can be seen in the following table:

Table 2. 2-Way Anava Test Results
Tests of Between-Subjects Effects

Dependent Variable: Retention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Learning Models SSCS	276.973	1	276.973	6.587	.013
Self Efficacy	660.105	1	660.105	15.699	.000
Learning Models SSCS * Self Efficacy	1.664	1	1.664	.040	.843

a. R Squared = .271 (Adjusted R Squared = .235)

1. Ho is rejected, meaning that there is a difference in the effect between groups of students using the SSCS learning model assisted by power point media and groups of students using the SSCS model assisted by textbooks on student retention of the classification material of living things. This is indicated by the value of p is $0.013 < 0.05$.

2. Ho is rejected, meaning that there are differences in the effect of self-efficacy between students with high self-efficacy and low self-efficacy students on student retention of the classification system of living things. This is indicated by the value of p is $0.000 < 0.05$.

3. Ho is accepted, meaning that there is no interaction between the model of media-assisted learning with self-efficacy on students' retention of the classification system of living things because the p value is $0.843 > 0.05$.

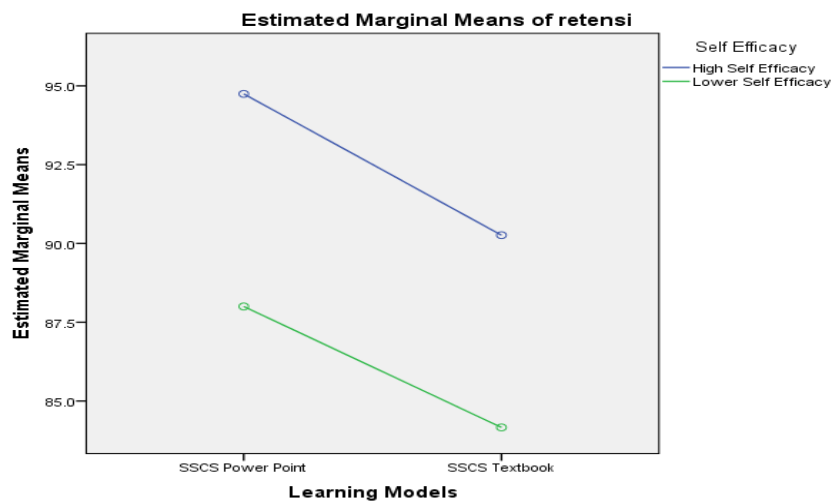


Figure 3. Interactions between power point assisted SSCS models and textbooks with student self-efficacy

The lack of interaction between SSCS-assisted learning models with power point and textbooks with student self-efficacy, can be seen from the figure 3. On the graph the axes formed horizontally and vertically do not show intersection lines. This shows that there is no interaction between the SSCS learning model variables and student self-efficacy, so Tukey's test is not carried out.

4. Discussion

4.1. The Effect of Power Point and SSCS Assisted Learning Models on Retention

Hypothesis testing using two-way ANAVA conducted (table 2), shows that there is an influence of the use of the SSCS power point model and the SSCS package book model on student retention on the material system of living things classification. This can be seen from the significance value or p value of 0.013 which is smaller than the α value of 0.05. The influence that occurs because, each stage in this model gives students the opportunity to practice their problem solving skills independently without relying on the teacher's help, so that understanding of the material becomes better.

The essence of the SSCS model according to Suciati (2013), this model can make students think to solve a problem by understanding the proposed problem. Better formed student understanding will also have an impact on student retention. This is consistent with the statement of Anderson (2001) that a good understanding of a material can reduce forgetfulness, because information about the material will be attached to its long-term memory.

During the search phase students work in groups to solve existing problems by thinking scientifically. Students then make a list of questions, then discuss prior knowledge by relating to the problem to be solved in the list of questions that have been made. Marzano et al., (2001) explain this phase makes students focus their attention on the problem to be solved so that it trains students' focus on an important part of learning. Gomulya (2015) also explained, when forming one's own questions and answering them one can better understand and remember the information provided.

The solve phase students answer the list of problems they have compiled from various sources including the internet. At this stage students are very possible for students to discuss with each other and articulate an explanation of what they are learning. According to Riffell & Sibley (2005) by solving many problems and answering several questions using the web students' understanding of biological content will increase. Silver (2004) also explained that during the small discussion process, debates would emerge that could improve students' ability to solve problems and increase their ability to think at a higher level.

During the create phase students will work collaboratively with a group of friends to design and produce something that will be displayed. Kurniawati & Fatimah (2014) stated that during the create phase students will develop thinking skills and recognize concepts based on the knowledge they have acquired. Chen (2013) also explained that this phase made students understand abstract concepts by pouring more structured thinking patterns so that they would improve their memory performance.

Improved student memory performance occurs in the hippocampus which plays a role in the formation of spatial and declarative memory. Fanani (2013) explains spatial memory related to memories about the shape of space, area, distance, area, direction and position. Declarative memories are divided into episodic memories relating to memories of past events, while semantic memories are related to abstract words, concepts, rules and ideas. Erikson et al., (2003) explain the increase in hippocampal activity will also affect amygdala activity, so that the process of memory consolidation increases so that during the encoding process it is possible to remember the stimulus provided can occur. Wirth (2015) explains consolidation is the process when an information is encoded into long-term memory while encoding is the process of encoding new information into memory.

The share phase is the final stage where students are given the opportunity to convey information to their friends based on what they have made. Marzano et al., (2001) when the student share phase will explain the results of the group's thinking each student will further deepen his understanding of what he is learning at that time. At this stage also students can

exchange information so that students' memory or retention of information becomes more complete.

In accordance with the statement of Sousa (2006) that there will be as much as 50% retention obtained by students from the discussion process, 75% retention is obtained as a result of training during the learning process and 90% retention will be obtained when students can teach what they understand to others again. The syntax of the SSCS learning model is continuous, making students will repeat the material they have learned by communicating their information back to others. The results of Ngadiyono's research (2009) also explain that retention can be increased by repeating the lesson.

The SSCS model is also a cooperative learning model based on problem solving that requires the active involvement of students in the implementation process from the beginning to the end of the model stage. This is consistent with Park's (2003) statement that involvement in learning activities will make students experience an increase in understanding and retention.

Research that has been done shows the difference in the average retention score between groups using the SSCS-assisted learning model with PPT and groups using the SSCS-assisted learning model with a textbook. Table 1 shows the average retention score in the experimental class using higher power point assistance (91.57), while the control class only (87.21). Based on Figure 1 also the posttest and retest scores of the experimental group using power point assistance are generally higher, when compared to the control group that only uses textbooks during the implementation of the SSCS learning model in class.

The group using the SSCS-assisted learning model PPT better retention results, due to the advantages possessed by the power point (PPT). The power point advantages compared to textbooks can be seen in terms of the appearance of more interesting learning content, such as videos or moving animations that can be displayed. This is consistent with Fateme's (2014) statement which explains that technology plays a role in facilitating teaching and learning processes. His research also mentions classes that carry out the learning process with the help of more accomplished power points.

Corbeil's research (2007) shows that students prefer learning with visual effects presented through power points rather than through textbooks. At the power point students are not only presented with content in the form of text, colors and images but can also include a variety of moving animation designs and even videos if needed. Ozaslan & Maden (2013) also concluded in his study that the effectiveness of the learning process occurs because learning material presented through visual tools such as power points attracts attention and makes students learn better. Pros et al., (2013) states the use of technology such as power points in learning has a positive effect, as long as its use is in accordance with the conditions inherent in learning.

The group that uses the SSCS-assisted learning model of the textbook has lower retention results because the textbook has several drawbacks in terms of visual appearance compared to power points. This is in accordance with Muslich (2010) which mentions some of the shortcomings of textbooks, namely that it is difficult to display motion or animation and presents too much reading, causing boredom of the reader.

4.2. Effect of Self-Efficacy on Retention

Research that has been done shows that the group of students with high self-efficacy has an average self-efficacy of 152.81, while the group of students with low self-efficacy has an average self-efficacy score of 113.66. In figure 2 students of the A1B1 and A2B1 groups with high self-efficacy using the SSCS learning model, it's just different help. The A1B1 group used the power point assistance while the A2B1 group used the help of the textbook, it turned out that the average retention scores were equally good, namely 94.73 and 90.26. Unlike the group of students with

A1B2 and A2B2 groups with low efficacy whose retention scores were only 87.99 and 84.16.

The average retention score obtained (figure 2), shows that students with high self-efficacy have better retention abilities than students with low self-efficacy. The results of this study are in accordance with the results of previous studies, conducted by Fitriana et al., (2015). Fitriana's research states that self-efficacy has a significant direct effect on learning outcomes with a confidence level of 93%. The retention score obtained by each student in this study, is an indicator of learning achievement as well. Majidah et al., (2014) also stated that self-efficacy is directly proportional to the learning outcomes meaning that if the self-efficacy of students is higher then the learning outcomes will be also high. Adman (2017) also states, self-efficacy is one of the strong factors that influence learning outcomes.

Students who have high self-efficacy tend to have strong self-confidence to successfully complete the tasks given according to the objectives or targeted results. Self-efficacy also influences thinking patterns and cognitive processes related to memory. This is in accordance with research that has been done by West et al., (2008) that self efficacy has great potential to improve one's memory abilities.

4.3. Interaction between SSCS Assisted PPT Learning Model and Package Book with Self-Efficacy.

There is no interaction between SSCS-assisted learning models with power point and textbooks with self-efficacy on student retention shown by the two end points of each line do not intersect at each other, which indicates the absence of interaction between the two variables. This is supported by Field (2009) who explains that the absence of intersecting lines in the two-way anova graph indicates no interaction. The cause of the intersection of the two lines is due to the presence of other factors that influence the interaction between these variables which were not examined in this study.

The reason for the lack of interaction between learning methods and self-efficacy in this study is also possible because the average results of students' retention ability scores in each group given a descriptive SSCS learning model have an average score that does not differ greatly between the experimental class and the control class with high self efficacy and low self efficacy.

This is consistent with the research conducted by Agnah (2018) which states that the cause of the interaction between learning methods and self-efficacy does not occur because the results of critical thinking scores tend to be classified as the same. Medyasari, et al., (2017) added that there was no interaction between variables because students were not accustomed to using the learning model and there were other variables that influenced the results of the study but were not measured. The use of SSCS-assisted learning models with power point and textbooks with self-efficacy, when given individually actually both have a positive influence on student retention. If given together, then what happens will not interact with each other SSCS learning model variables and self-efficacy of student retention. This is consistent with research conducted by Fitriana et al., (2015) states that direct self-efficacy does not have a significant effect on learning activities. This means that although learning activities in the classroom have implemented the SSCS model which is considered to be in accordance with the expected learning activities, it turns out that between the SSCS-assisted learning model PPT and textbooks with student self-efficacy, there is still no interaction to interact with each other to increase retention.

5. Conclusions

The use of the Search, Solve, Create and Share learning models in this study has an effect on student retention, especially on the classification of living things. Self-efficacy possessed by each student also has an influence on student retention. this can be seen from the results of hypothesis testing using two-way anova and the average retention score of each group.

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