

PROJECT-BASED LEARNING USING SCRAPBOOK ON HUMAN RESPIRATION SYSTEM MATERIAL TO IMPROVE CREATIVE THINKING SKILLS

Sahara Putri Rizky¹, Djohar Maknun¹, Yuyun Maryuningsih¹

¹Institut Agama Islam Negeri Syekh Nurjati, Cirebon, Indonesia

Email: saharaputririzky04487@gmail.com¹, maknundjohar@gmail.com²

yuyunmaryuningsih2014@gmail.com³

Abstract

The development of learning models in the 21st century is currently very interesting, one of which is using a learning model in the form of project-based learning which requires students to make a product with work that is quite realistic and useful and can be sold. In addition, learning to make products also involves a process of creative thinking in students before they put their ideas or ideas into the products they will make. Before they make them require to design, study the materials associated to make the product. Students are required to understand the material by making very interesting works. This research aims to improve students' creative thinking in high school in learning biology in class through the application of unique and interesting learning. The research method used is a quantitative method and literature study which involves quantitative analysis of the normality test, homogeneity test, and the Mann Withney U test. The research results show that there is a significant difference by looking at the average results of the pretest and posttest after the learning has been carried out. This shows that making scrapbooks in biology learning can be effective as a learning innovation so that it is not too monotonous.

Keywords: *Project Based Learning, Scrapboo*

Abstrak

Perkembangan model pembelajaran pada abad 21 saat ini sangat menarik salah satunya menggunakan model pembelajaran berupa project based learning yang mengharuskan siswa membuat suatu produk dengan karya yang cukup realistis dan bermanfaat serta dapat bernilai jual. Selain itu, pembelajaran membuat produk juga melibatkan proses berpikir kreatif pada siswa sebelum mereka menuangkan ide-ide atau gagasan mereka kepada produk yang akan mereka buat. Sebelum mereka membuat mereka mengharuskan merancang, mempelajari materi yang dikaitkan untuk membuat produk tersebut. Siswa dituntut memahami materi ddengan membuat karya yang sangat menarik. Adapun penelitian ini bertujuan untuk meningkatkan cara berpikir kreatif siswa di SMA dalam pembelajaran biologi di kelas melalui penerapan pembelajaran yang unik dan menarik. Metode penelitian yang digunakan adalah metode kuantitatif dan studi literatur yang melibatkan analisis kuantitatif uji normalitas, uji homogenitas, dan uji *Mann Withney U*. Hasil Penelitian menunjukkan adanya perbedaan yang signifikan dengan melihat hasil rata-rata dari *pretest* dan *posttest* setelah dilakukannya pembelajaran tersebut. Hal tersebut menunjukkan bahwa pembuatan *scrapbook* dalam pembelajaran biologi bisa efektif sebagai inovasi pembelajaran agar tidak teralalu monoton.

Kata kunci: *Project Based Learning, Scrapboo*

Introduction

Based on the observation that has been done at SMAN 1 Sumber, the researcher finds out some assumptions among students about learning biology, it is too much memorization using unfamiliar terms and quite difficult to understand. That opinion comes from the

materials that are far from the students' daily life so they feel quite hesitant to learn that lesson and it leads to the derivation of their academic achievement. Thus, a teacher needs to provide daily-life project that might attract the students' attention in learning biology at school and use the various yet fun learning methods.

The proper teaching material that the researcher considers suitable to be used in the class is *scrapbook*. Scrapbook comes from the word "scrap" which means leftover. But it is not only an activity of sticking from leftover items but also the art of sticking leftovers on the blank paper. Originally, scrapbooking was an art activity of sticking photos on paper and decorating them to be creative work. This activity has been done in education activity as Bragg's research entitled 'Scrapbook as a resource in media research with young people aims to explore the content, form, target, and readers' impression of scrapbooks. The research on scrapbook as a teaching material has ever been conducted by Damayati *et all* (2017) which proves the increasement of students' learning outcome that uses scrapbooking.

One of the learning models that is appropriate and suitable for making scrapbook project is 'Project Based Learning' (PjBL) model which is innovative and emphasize contextual learning through complex activities. PjBL is also a learning model which focuses on creative thinking, problem solving, and interaction between students and their peers to create and use new knowledge.

The non-optimal skills of students' creative thinking will influence their comprehension ability. Project-based learning intervention provides the opportunity for students' potential development so that their creativity evolves optimally. This learning model emphasizes students' creativity and their skills to cooperate with their peers to solve a problem by work production. In cycle II, there was an increment of 4.88% from 76.46% to 81.34% (Sulastringsih & Musadad, 2020). Besides, according to Rahmzatullaili in 2017, creative thinking skill is one of the skills that can be grown through the learning process because in solving a problem the students need to have flexible thinking skill which is one of the creative thinking aspects. This skill can be measured by idea creation techniques, generating new meaningful ideas, elaborating ideas, refining ideas, analyzing ideas, and evaluating ideas.

The advantage of project-based learning is that it evolves the total involvement of each individual in learning process. It is students' activity-oriented model and suitable for ensuring individual accountability in group discussion or performance (Khanifah, Nasution Musaji, 2019).

Scrapbooking as learning tool will help to evaluate the learning effectivity. It should be directive such as concept maps, pictures, decorations containing the material that will be the main theme of scrapbooking. There are three indicators of scrapbook scoring namely the suitability of the pictures in used, the definition of the pictures, and the suitability between two aspects keduanya (Alfiah, Putra, & Subali, 2018).

The topic that will be taught is respiration system. The researcher chose this topic due to the numerous picture used in the discussion that the students have to understand and there were a lot of important things that needed to be noted in the process of human respiration mechanism.

The researcher is interested in doing the study about scrapbooking by applying the PjBL learning model since it has many superior and beneficial values. Moreover, giving the respiration system material will allow the students to experience a different and fun learning activity so that it will give the differences towards students' skill and creative thinking. The importance of this assessment is to know the process and the result of scrapbooking based on the respiration system material that affects on students' creative thinking.

Method

Research Method

This research used quantitative method followed by literature review. The quantitative method was conducted to analyse the result of students' product on biology using scrapbook on the respiration system material. Meanwhile, literature review was provided to reinforce the findings in the research results which was adjusted based on the previous relevant studies.

Research Setting

This research was conducted in biology class using scrapbook on the students of class XI MIPA 4 SMAN 1 SUMBER 2022/2023. In addition, it was held in March to April 2023. There were three meetings in conducting this scrapbook project.

Population and Sample

The population of this research was 252 students of class XI MIPA who attended biology class. The sample of this population was only from class XI MIPA 4 which consisted of 13 male students and 23 female students.

Research Instruments

The instrument of this research consisted of scissors, double-sided tapes, and students' worksheets for the trials of scrapbooking. Meanwhile, other materials or tools being used in this project were HVS papers, cover papers, accessories or decorations, and respiration system materials as well as pretest and posttest to measure how far their creative thinking can be optimally obtained.

Research Procedures

This research involved two procedures in collecting and arranging the data report. The first procedure was conducting the learning process which was about respiration system using scrapbook, meanwhile the second procedure was exploring the supporting research data using the previous relevant research data.

As for the first step, namely the implementation of biology learning using scrapbook has a mechanism where the class begins with praying together, reciting Quran together on Tuesday at 8.30 a.m. to 10 a.m. in XI MIA 4 classroom and on Wednesday at 7.30 a.m. to 8.30 a.m. The students conduct pretest to measure the first condition before the treatment. After that, the students gather with their groups and do the given LKPD to create a project at home. This activity is done repeatedly for three meetings until the scrapbook project is done and presented by the students in the classroom. Then the products of scrapbook are submitted to be checked and scored by the researcher objectively. After that, the students do the last test or posttest to know their creative thinking skills.

The second step is the exploration of research supporting data using the previous relevant data sources that has mechanism where it starts with searching the references such as books, printed journals, or online journals related to the topic discussed. From the references that have been obtained, the researcher selects the related topic discussion and paraphrases the main ideas with her own understanding. The last is sorting out the data using the available template neatly and systematically.

Sampling Technique

The sample of data used in this research involves probability sampling through the use of random sampling. Simple random sampling is a random sampling technique for all members of the population regardless of the population strata (Sugiono, 2011). This technique

is chosen since the population of this research is homogenous which is all of the students of XI MIA. The total population is 252 students thus the researcher only choose one class which is 36 students from XI MIA 4.

Data Collection Technique

The data used in this research was collected by measurement technique that involves a test that has been done by the members of the sample class namely the students of XI MIPA 4. This test played a role as a stimulus in order to obtain the research data from the sample class that may answer the available research variable which is numerical scores that show the skill of creative thinking. The test carried out is a written test in the form of description test that is relevant to the respiration system material. The question were distributed with barcodes.

Data Analysis Technique

This research data was obtained from a written test in the form of pretest and posttest score with the topic respiration system. Then, the research data was analyzed by an application called SPSS especially the analysis test in the form of homogeneity and normality test as a precondition test and data validity, as well as the Mann Withney U test.

The first data analysis technique is the normality test as the precondition and validity test. Normality test is a data testing technique used to analyze the distribution of values in a normal data sample (Sarwono & Salim, 2017). It involves SPSS version 16.0 application. The data in this test is only 36 data or less than 50 data, thus the type of this normality test is Shapiro-Wilk. The basis for making decisions on this normality test, namely: if the Sig value. (Significance) or the probability value on the results of the Shapiro-Wilk normality analysis is less than 5% or 0.05, then it shows that the research data is normally distributed.

The second data analysis technique is the homogeneity test as the precondition and validity test. Homogeneity test is a data testing technique used to prove that the data samples involved in this study come from the same condition or are homogeneous (Sarwono & Salim, 2017). It involves SPSS version 16.0 application that is analyzed by examining the Sig value. (Significance) or probability value on the results of anova data analysis. The basis for making decisions on this homogeneity test, namely: if the Sig. (Significance) or the probability value on the results of this homogeneity test analysis is less than the 5% tolerance limit or 0.05, then it shows that this research data has the same variation or is homogeneous data.

The last data analysis technique is Mann Withney U since the data obtained is non-parametric. The two groups of data tested is pretest and posttest score of XI MIPA 4 students in respiration system class. Based of the Mann Withney U test, the influence of scrapbooking in respiration system learning can be seen.

Result and Discussion

Research Data

Average Pretest and Posttest Scorest

Table 1. Average Pretest and Posttest Scores

No.	Test Type	Average Score
1.	Pretest	42,58
2.	Posttest	78,42

Based on table 1, the average score from pretest or before treatment is 42.58 meanwhile the posttest score or after treatment is increasing to be 78.42.

Prerequisite Test and Validity Test

1. Data Normality Test

Table 2. Normality test result as the prerequisite test and data validity

Sample	Prerequisite Test	Sig.	Description
Pretest	Normality test	0,051	Not Normal
Posttest	Normality test	0,013	Not Normal

Based on table 3, the result of the normality test for each tests does not distribute normally. The signification score for the pretest is 0.051 meanwhile the posttest is 0.013.

Homogeneity Test

Table 3. Homogeneity test analysis results as a prerequisite test and data validity

Sampel	Prerequisite Test	Sig.	Description
Pretest	Homogeneity Test	0,170	Not Normal
Posttest	Homogeneity Test	0,182	Not Normal

Based on table 3, the result of the homogeneity test for each tests does not distribute normally. The signification score for the pretest is 0,170 meanwhile the posttest is 0,182.

Mann Withney U Test

Table 4. The results of creative thinking analysis using the Mann Withney U test

Mann-Withney U	148,500
Wilcoxon W	814,500
Z	-5,694
Sig	0,000

Based on table 4, the score of Mann Withney U test is 148.500, Wilcoxon W test is 814.500, Z score is -5,694 and the signification is $0.000 < 0.05$ which means there is significant differences.

Highly interactive learning media with technology-based skills in these days is an important aspect in globalization. The evolution of technology in the era of globalization is an innovative change in the field of education by having a lot of student creativity in a new dimension of learning that is more competitive (Dewi, et al., 2019). The ways to be able to perform 21st-century skills by using facilities and infrastructure, improving the quality of professional teachers by IT training, and conducting university students seminar or training about the IT learning media (Rahmatan, et al., 2012).

The basic characteristic of creative thinking is to show the potential or capability I solving a problem, arguing based on the fact and emotionally having stable mentality to do responsibility and duty (Mahamit, Aloysius, & Suwono, 2020). The main characteristic of Donovan creativity is the idea creation technique, creating meaningful ideas, elaborating ideas, refining ideas, and evaluating ideas (Donovan, 2014).

The education of creativity and innovation focuses on the creative thinking, creative collaborating, innovation implementation. Creative thinking requires the students to use any kinds of idea-creating technique, creating ideas that are fresh and meaningful, elaborating, refining, analyzing, and evaluating their ideas to increase and maximize the creative effort. Their creative effort towards others and obtaining some feedbacks and keep revising based on authentic dialogue in virtual life are one of good examples of how technology can be used to promote and support the skills of the 21st-century students. The 21st-century skills framework suggests that teaching effective reasoning, the use of systems thinking, judgment

and decision making, and problem solving builds learners' ability to think critically and solve problems (Donovan, 2014).

Creative thinking is a skill to provide solution in solving a problem so that it can create something new and different from others. By thinking creatively, the students are able to see the world in any kind of perspectives so they can create new solutions to solve some problems in real life (Fitriyah & Ramadani, 2012).

Project-based learning will make the students work in a team, discover the skills of planning, organizing, negotiating, and consensus building on the issues of tasks to be done, who will be responsible for every task, and how the information will be collected and presented scientifically (Saenab, Yunus, & Husain, 2019). Learning model is also necessary in learning process to attract the students' passion to study because something new will leave an impression in learning activity. For instance, learning to make a product together in a group such as scrapbooks. Bellows are the steps to make a scrapbook:



Picture.1 Scrapbook-Making Process

Scrapbooking is an art of sticking photos on paper and decorate it to be a creative work. It has some advantages such as adopting it as an interesting learning media so that the students can concentrate more to the lesson. The materials to make a scrapbook are quite easy to find. So, by using scrapbook, the students get more interested in learning (Veronica, Pusari, & Setriawardana, 2018).

Human respiration system is an organ system used to inhale oxygen from the air and remove carbon dioxide and water vapor, In the process of breathing, oxygen is the main important substance. Oxygen is obtained from the air in the surrounding environment, the respiratory system brings the air that contains oxygen and remove the air with carbon dioxide and water vapor, the purpose of respiration process is to get energy. In inhaling process occurs energy releasing, human respiratory system includes the respiratory tract, respiratory mechanisms and respiratory system disorders. (Munawir, 2020).

The table. 1 shows that the data is continued by normality test and there is significant score less than the alpha score 0.05. It can be seen that the significance in Shapiro wilk, the pretest score is 0.051 and the posttest is 0.013 so that the significant score is less than 0.05 thus it means that the sample does not distribute normally.

Uji Homogenitas dilakukan untuk mengetahui apakah adanya data yang berdistribusi homogen sebelum dilakukan perlakuan. Data dikatakan homogen jika nilai signifikasinya lebih dari 0,05. Dari uji diatas didapatkan nilai pretest adalah 0,170 dan posttest adalah 0,182 yang menunjukkan bahwa variabel pretest dan posttest pada kelas eksperimen adalah homogen, dengan *levene statistic* 1,701 dan 1,645. Karena data tersebut tidak berdistribusi

dengan normal namun bersifat homogen maka dilakukanlah uji hipotesis berupa uji *Mann Withney U*.

Homogeneity test is conducted to know whether there is homogenous data before the treatment is given. Data is homogeneous if the significance value is more than 0.05. From the test above, the pretest value is 0.170 and the posttest is 0.182 which shows that the pretest and posttest variables in the experimental class are homogeneous, with a Levene statistic of 1.701 and 1.645. Because the data was not normally distributed but homogeneous, the hypothesis test was carried out in the form of the Mann Withney U test.

The pretest is done with the average score in table 1 namely 42.58 and the researcher did a treatment in that class by conducting a scrapbook activity as an innovation to increase the students' creativity. Then the class obtained an average score of 78.42. It can be seen that there was a significant improvement.

Based on table 4, the score from Mann Withney U test was 0.000 which means the data is not innovative from 0.05 and it can be said that the result of the data has significant difference. The discoveries that the researcher obtains are the new learning method using scrapbook that can also become effective to increase students' creative thinking. However, beside the discovery, the researcher also find some difficulties or obstacles such as the adequate time to do the project, the materials and tools needed, as well as students and the researcher's capability to do the learning process well.

Conclusion

Based on the data analysis result above, it can be concluded that the Mann Withney U test score was <0.05 and the significant score was 0.000. it means that there was significant difference between the implementation of biology lesson using scrapbook and the creative thinking of the students of SMAN 1 Sumber. Therefore, the researcher gives her humble opinion about doing scrapbook in biology class can be so effective to increase the students' learning passion so that the lesson will not be monotonous yet interesting.

Reference

- Alfiah, A. N., Putra, N. D., & Subali, B. (2018). Media Scrapbook sebagai Refleksi Jurnal untuk Meningkatkan Kemampuan Kognitif dan Regulasi Diri. *JP (Jurnal Pendidikan)*, 3(1), 57-67.
- Damayanti, M., & Zuhdi, U. (2017). Pengaruh Media *Scrapbook* (Buku Tempel) terhadap Hasil Belajar Siswa Materi Keragaman Rumah Adat di Indonesia Kelas IV Sekolah Dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 5(3).
- Dewi, R. K., Wardani, S., Wijayati, N., & Sumarni, W. (2019). Demand of ICT-Based Chemistry Learning Media in the Disruptive Era. *International Journal of Evaluation and Research in Education (IJERE)*, 8(2): 265-270.
- Donovan, L. (2014). Examining The 21st Century Classroom : *Developing An Innovation Configuration Map*. *Educational Computing Research*, 50(2), 161-178.
- Fitriyah, A., & Ramadani, S. D. (2021). Pengaruh Pembelajaran STEAM Berbasis Pjbl (*Project-Based Learning*) Terhadap Keterampilan Berpikir Kreatif dan Berpikir Kritis. . *Jurnal Pendidikan*, 10(1), 209-226.
- Khanifah, L. N., Nasution, & Musaji. (2019). Pengaruh Penggunaan Model Project Based Learning dan Keterampilan Kolaborasi Terhadap Hasil Belajar Siswa Kelas IV Sekolah Dasar. *Jurnal Review Pendidikan Dasar : Jurnal Kajian Pendidikan dan Hasil Penelitian*, 5(1).

- Mahamit, A. J., Aloysius, D. C., & Suwono, H. (2020). Efektivitas Model Project-Based Learning Terintegrasi STEM (PjBL-STEM) terhadap Keterampilan Berpikir Kreatif Siswa Kelas X. *Jurnal Pendidikan : Teori, Penelitian dan Pengembangan*, 5(9), 1284–1289.
- Munawir. (2020). *Modul Pembelajaran SMA Biologi Sistem Penapasan Biologi Kelas XI*. Jakarta: DIKNAS.
- Rahmatan, H., Liliyasi, & Redjeki, S. (2012). Pengembangan Model Pembelajaran Biokimia Berbasis Komputer untuk Membekali Keterampilan Berpikir Kreatif Mahasiswa Calon Guru Biologi. *Jurnal Pendidikan IPA Indonesia*, 1(2): 178-182.
- Rahmazatullaili, Zubainur, C. M., & Munzir, S. (2017). Kemampuan Berpikir Kreatif dan Pemecahan Masalah Siswa Melalui Penerapan Model Project Based Learning. *Beta : Jurnal Tadris Matematika*, 10(2), 166-183.
- Saenab, S., Yunus, S. R., & Husain. (2019). Pengaruh Penggunaan Model *Project Based Learning* terhadap Keterampilan Kolaborasi Mahasiswa Pendidikan IPA. *Biosel : Biology Science and Education*, 8(1), 29-41.
- Sarwono, J., & Salim H.N. (2017). *Prosedur-Prosedur Populer Statistik untuk Analisis Data Riset Skripsi*. Yogyakarta: Gava Media.
- Sugiono. (2011). *Metode Penelitian Kuantitatif, Kualitatif, dan Kombinasi (Mixed Methods)*. Bandung: Alfabeta. Hal. 67.
- Sulastriningsih, & Musadad, A. A. (2020). Penerapan Model Pembelajaran Project Based Learning dengan Media *Scrapbook* untuk Meningkatkan Kreativitas dan Hasil Belajar Sejarah Kelas X MIPA 4 SMA Batik 1 Sukarta Tahun Ajaran 2019/2020. *Jurnal CANDI*, 20(2), 93-114.
- Veronica, I., Pusari, R. W., & Setriawardana, M. (2018). Pengembangan Media *Scrapbook* pada Pembelajaran IPA. *Jurnal Ilmiah Pendidikan dan Pembelajaran*, 2(3), 258-266.