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The Influence of Discovery Learning with Nearpod on Science Process Skills and Learning Outcomes

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ABSTRACT

Low science process skills and learning outcomes in digestive system topics stem from non-interactive learning. This study aimed to determine the influence of the Discovery Learning model assisted by Nearpod media on students' science process skills and learning outcomes in the digestive system topic. A quasi-experimental non-equivalent control group design was used, involving two classes and analyzed via MANOVA/ANCOVA. MANOVA revealed significant influence on observation (0.313) and classification (0.716) indicators. The experimental group's mean score rose from 60.40 to 83.60, outperfoming the control group (74.00). ANCOVA showed significance of 0.020 ($p < 0.05$). Nearpod assisted Discovery Learning significantly enhances students science process skills and learning outcomes.

INTRODUCTION

Education in Indonesia continues to evolve in response to the increasingly complex and dynamic demands of the 21st-century educational landscape. One of the main goals of education is to improve learners' quality and competence, both cognitively and non-cognitively (Ministry of Education and Culture, 2020). In the context of science education, this goal is reflected in the development of science process skills, which include the ability to observe, conduct experiments, collect and analyze data, formulate hypotheses, and draw conclusions (Rezky, M., et al, 2022).

In practice, however, learning outcomes in certain science topics, such as the digestive system, remain suboptimal. A study by (Sari & Yuliana, 2021) revealed that students often face difficulties in understanding digestive system concepts due to the use of less interactive teaching methods. These teacher-centered approaches result in low student engagement and limited opportunities for scientific reasoning, which in turn affect both their science process skills and learning achievements (Mulyani, A., et al, 2020).

One of the main challenges faced in high school biology learning is delivering complex material in an engaging and easy-to-understand way for students. Meanwhile, learning that focuses solely on theory and memorization often makes students feel bored and less interested. The continued use of lecture-based and memorization-focused instruction reduces students' motivation and interest in science (Rahmawati, 2019). A more interactive and engaging learning approach needs to be applied, one of which is through the implementation of a learning model that prioritizes active student participation in the learning process. (Sukardi, Wigati, & Masripah, 2019) show that the use of the Discovery Learning model can have a significant impact on students' learning outcomes in biology education in Palembang, especially at the junior high school level. This finding reinforces the idea that discovery-based learning provides an exploration space that positively affects students' understanding.

The Discovery Learning model is one approach that can be used to enhance students' scientific process skills. Discovery Learning focuses on developing students' abilities to discover knowledge independently through experiments, observations, and reasoning. This Discovery

Learning model encourages students to actively engage in every step of the learning process, from problem identification to drawing conclusions. By using this approach, it is hoped that students can better understand biological concepts in depth and can apply that knowledge in everyday life. According to (Wati, 2018) research , the Discovery Learning model has proven to be effective in the learning process. However, the research also shows that there are challenges in its implementation, such as the lack of supporting media that can enhance efficiency and student engagement during the learning process.

One solution to overcome these challenges is to utilize technology-based learning media. The use of technology-based learning media is very important to support more interactive and enjoyable learning. Technology-based learning media can enrich students' learning experiences, increase their motivation, and facilitate more effective interaction in the learning process. Several studies related to the application of interactive media in biology learning show that the use of technology can enhance student engagement, improve conceptual understanding, and increase learning outcomes. A study by (Yuliana, Siregar, & Lestari, 2023) demonstrated that Nearpod significantly improved students' integrated science process skills, with post-test scores showing substantial increases compared to the control group.

One of the technology-based learning media developed for 21st-century learning is Nearpod. Various studies have proven that this application makes learning more engaging and innovative. Nearpod is a technology-based learning platform that allows teachers to create interactive presentations by adding various multimedia elements such as images, videos, quizzes, surveys, and more. Using Nearpod, students not only listen to explanations from the teacher but can also interact with the material through the features available in the application. Additionally, Nearpod also enables teachers to monitor students' learning progress in real-time, allowing them to provide quicker and more targeted feedback. According to research (Hadi, T,. et al, 2022), the use of Nearpod in the Discovery Learning model can facilitate students in exploring the material independently and interactively, which can enhance their science process skills and improve their learning outcomes as students become more actively engaged in the learning process.

Several studies related to the use of Nearpod show positive results in improving students' science process skills and learning outcomes. According to (Wulandari, 2022), the use of Nearpod in learning can enhance students' analytical skills and understanding of concepts in biology. This study also found that students are more enthusiastic and actively engaged in learning when using Nearpod media. The use of this media in biology learning, especially on the digestive system material, Nearpod can be used to introduce concepts visually, for example, by presenting animations of the digestion process, interactive quizzes, and providing simulations that help students understand the relationship between the structure and function of digestive organs more effectively.

Science process skills are closely related to the use of interactive media. Media like Nearpod can help students practice science process skills, such as observing, analyzing data, and drawing conclusions, through the interactive features provided. For example, the simulation of the digestive system presented in Nearpod can help students understand the mechanical and chemical processes that occur in the human body, while also training them to think scientifically. According to (Nugroho, 2022), science process skills are very important to be developed in biology learning, as these skills are not only related to understanding theory, but also to the ability to apply biological concepts in everyday life. By using the Discovery Learning model supported by Nearpod media, it is hoped that students can optimally develop science process skills.

In addition, based on (Setiawan, 2021) research , the use of technology-based learning media such as Nearpod can improve student learning outcomes. This media allows students to learn in a more interactive way and provides immediate feedback. In addition, the development of interactive media such as Nearpod has also begun to be implemented locally. Research by (Wulan, 2023) in high schools in Palembang has proven that Nearpod is suitable for use as a biology learning medium because it can visualize material such as biodiversity interactively. By combining the

Discovery Learning model with Nearpod media, it is hoped that biology learning on the digestive system material can be conducted in a more interactive and efficient manner, and not only improve students' science process skills and learning outcomes, but also foster students' interest and motivation to study harder.

However, despite many studies showing the effectiveness of the Discovery Learning model and the Nearpod media, there is still a gap in research that relates to both fields concurrently. Research that combines the use of the Discovery Learning model with Nearpod media in biology learning at the Senior High School level, particularly on the topic of the digestive system, is still rarely conducted. This study is expected to contribute to filling the research gap regarding the influence of the Discovery Learning model supported by Nearpod on students' science process skills and learning outcomes, especially on the topic of the digestive system. Therefore, this study aims to examine the effect of using the Discovery Learning model supported by Nearpod media on students' science process skills and learning outcomes related to the topic of the digestive system in class XI of Senior High School.

MATERIALS AND METHODS

1. Time and Place of Research

This research was conducted in the even semester of the 2025/2026 academic year at SMA Negeri 1 Palembang, located in Ilir Barat I District, Palembang City, South Sumatra Province.

2. Research Methods

The study employed a quasi-experimental design using a nonequivalent control group design, which is appropriate for classroom-based research without random assignment of participants (Creswell & Creswell, 2018). The research subjects consisted of two classes, namely an experimental class and a control class. The experimental class was taught using the Discovery Learning model assisted by Nearpod, while the control class implemented the Discovery Learning model without Nearpod.

The experimental group was designated as Class A, and the control group as Class B. Both groups were administered pretests and posttests to measure students' science process skills and learning outcomes. In this study, Nearpod media served as the independent variable, whereas science process skills and learning outcomes were the dependent variables. The use of Nearpod was based on its ability to provide interactive, multimedia-based learning experiences that enhance student engagement and conceptual understanding (Cut Tiara, et al, 2024).

3. Population and Sample

The population in this study included all Grade XI students of SMA Negeri 1 Palembang. The sample was determined using a non-probability sampling technique, specifically purposive sampling. The selected sample consisted of two classes: XI.4 as the experimental class and XI.5 as the control class. The determination of these classes was based on the results of discussions with the biology subject teacher and school authorities, considering factors such as students' academic equivalence and class schedule availability.

4. Research Procedure

This research uses a procedure that goes through several stages. The stages of the research procedure are presented in the figure below.

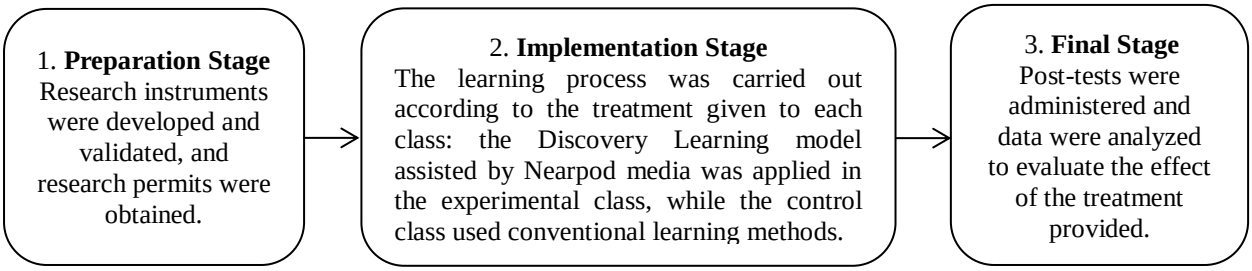

Figure 1. Stages of the research (Creswell & Creswell, 2018)

5. Data Collection

Data collection techniques can be carried out using test instruments, and the data obtained from this study consists of science process skills tests and achievement tests. The achievement test given consists of pre-test and post-test using multiple choice questions, each consisting of 15 items. The science process skills test provided is in the form of an evaluation test using multiple choice questions totaling 15 items.

6. Data Analysis

Data analysis techniques include prerequisite tests and hypothesis tests. The prerequisite test for normality uses the Shapiro-Wilk test and the homogeneity test uses Levene's test. After the prerequisite tests are conducted, a MANOVA hypothesis test is performed to examine science process skills by comparing indicators and an ANCOVA hypothesis test to assess the cognitive learning outcomes of the students. This test is conducted using the SPSS version 26 application.

RESULTS AND DISCUSSION

Based on research results, the influence of the discovery learning model assisted by Nearpod media on science process skills and learning outcomes of students on the digestive system material in class XI of high school. The results were obtained using evaluation test questions, pre-test, and post-test. The assessment of science process skills and learning outcomes was conducted through normality tests, homogeneity tests, and hypothesis tests, resulting in the following findings. The results of the calculation of the description of the scientific process skills can be seen in Table 1.

Table 1. Descriptive Statistical Data Scientific Process Skills

Indicator	Descriptive Statisctic			
	Class	Mean	Std. Deviation	N
Observation	Experiment	88.29	16.050	31
	Control	83.43	20.946	30
Classification	Experimen	86.16	16.553	31
	Control	84.60	16.745	30
Interpretation	Experimen	86.29	16.880	31
	Control	75.00	22.743	30
Hypothesis	Experimen	76.77	20.718	31
	Control	66.00	21.107	30

Table 1 shows that the average score of students' science process skills in the experimental class is higher than that of the control class across all indicators, namely observation, classification, interpretation, and hypothesis formulation. The highest average score is found in the observation indicator, with 88.29 in the experimental class compared to 83.43 in the control class. In addition, the standard deviation in the experimental class tends to be smaller than in the control class, indicating more homogeneous data and more evenly distributed student abilities. This suggests that the use of the Discovery Learning model assisted by Nearpod media has a positive impact on improving students' science process skills. This finding is also supported by (Surya, 2020), who stated that students' science process skills significantly increased through discovery-based learning approaches supported by interactive digital media. Thus, the data in Table 1 are consistent with previous theories and research, which indicate that Discovery Learning combined with Nearpod is an effective approach to developing students' science process skills. The results of the calculation of the description of the learning outcomes can be seen in Table 2.

Table 2. Descriptive Statistical Data Learning Outcomes

Class		Statistic	
Pre-test	Experiment	Mean	73.55
		Median	73.00
		Std. Deviation	14.546
		Minimum	47

Class		Statistic	
		Maximum	100
Pot-test	Control	Mean	65.63
		Median	67.00
		Std. Deviation	19.665
		Minimum	27
		Maximum	100

Table 2 presents the descriptive statistics of students' learning outcomes based on the pre-test in the experimental class and the post-test in the control class. The average pre-test score in the experimental class was 73.35, while the post-test average in the control class was 65.63. The minimum and maximum values in both groups indicate a wide range of achievement among students. These data suggest that learning outcomes improved following the treatment, although variability among students also increased. This finding is consistent with (Firdaus, Rahmawati, & Prasetyo, 2019), who stated that the use of technology-based learning media can enhance student achievement while also contributing to performance variation. Similarly, (Wulandari, 2022) emphasized that interactive tools like Nearpod improve understanding but outcomes may still vary depending on each student's level of engagement.

Calculations were carried out using the Shapiro-Wilk test on the evaluation data. The resultes of the normality test for science process skills can be seen in Table 3, and the normality test results of learning outcomes can be seen in Table 4.

Table 3. Test of Data Normality Scientific Process Skills

Tests of Normality

		Shapiro-Wilk		
	Class	**Statistic**	**df**	**Sig.**
Result	Experiment Class	0.943	31	0.102
	Control Class	0.944	30	0.114

Table 3 presents the results of the Shapiro-Wilk normality test for science process skills data. The significance values (Sig.) for the experimental class (0.102) and the control class (0.114) are both greater than 0.05, indicating that the data are normally distributed. This suggests that the data meet the assumptions for parametric analysis and can proceed to further inferential statistical tests. The normal distribution also reflects consistent measurement procedures and data that are representative of the population. This finding aligns with (Sudjana, 2005), who emphasized that normality testing is essential for ensuring the validity of inferential statistical procedures. Additionally, (Priyatno, 2014) states that the Shapiro-Wilk test is appropriate and reliable for small to medium-sized samples. The confirmation of normality strengthens the validity of the MANOVA test used in this study to analyze the effect of the treatment on students' science process skills. Therefore, the results in Table 3 confirm that the statistical assumptions are met, and the data are suitable for further analysis.

Table 4. Test of Data Normality Learning Outcomes

Tests of Normality

		Shapiro-Wilk		
	Class	**Statistic**	**df**	**Sig.**
Pre-test	Experiment	0.939	31	0.077
	Control	0.933	30	0.060
Post-test	Experiment	0.943	31	0.100
	Control	0.965	30	0.418

Based on Table 4, the normality test uses values of Sig > 0.05, indicating that the data is normally distributed. If Sig < 0.05, the data is not normally distributed. Based on the results of the normality test in table 4.5, it was found that Sig > 0.05, namely: 0.077 for the experimental pre-test,

0.060 for the control pre-test, 0.100 for the experimental post-test, and 0.418 for the control post-test. Therefore, all data are normally distributed and suitable for further parametric analysis.

Testing for normality is essential in determining whether data meet the assumptions required for inferential statistical analysis. (Priyatno, 2014) also emphasizes that the Shapiro–Wilk test is appropriate and effective for small to medium sample sizes in educational research. Thus, the results in Table 4 confirm that the data were collected under statistically valid conditions, strengthening the credibility of the findings related to the effectiveness of Discovery Learning assisted by Nearpod media.

Homogeneity testing is conducted to determine whether the data is normally distributed or not, with the condition that the data is considered normally distributed if it meets the criteria for the Sig value. The results of the homogeneity test of science process skills can be seen in Table 5 and the homogeneity test of learning outcomes in Table 6.

Table 5. Test of Data Homogeneity Scientific Process Skills
Test of Homogenity of Variances

		Levence Statistic	**df1**	**df2**	**Sig.**
Observation	Based on Mean	4.320	1	59	0.042
	Based on Median	1.038	1	59	0.313
Classification	Based on Mean	.456	1	59	0.069
	Based on Median	.134	1	59	0.502
Interpetation	Based on Mean	1.514	1	59	0.233
	Based on Median	1.428	1	59	0.237
Hypothesis	Based on Mean	.227	1	59	0.636
	Based on Median	.250	1	59	0.619

The output results in Table 5 using the Levene test show that the study findings indicate that the Sig. Based on the mean values, for the observation indicator $p > 0.042$, classification $p > 0.069$, interpretation $p > 0.233$, and hypothesis $p > 0.636$. According to (Tabachnick & Fidell, 2019), ensuring homogeneity of variance is essential for the validity of statistical tests, as violations can bias the interpretation of treatment effects. (Razali & Wah, 2011) emphasize that when both normality and homogeneity assumptions are satisfied, the reliability of parametric analyses improves significantly. Therefore, the results presented in Table 5 confirm that the data structure supports valid statistical inference regarding the effectiveness of Discovery Learning assisted by Nearpod media.

Table 6. Test of Data Homogeneity Learning Outcomes
Test of Homogenity of Variances

		Levence Statistic	**df1**	**df2**	**Sig.**
Pre-test	Based on Mean	2.630	1	59	0.110
	Based on Median	2.096	1	59	0.153
Post-test	Based on Mean	.441	1	59	0.509
	Based on Median	.482	1	59	0.490

The output results in Table 6 of homogeneity using Levene's test show that the research findings indicated that the Sig. Based on Mean pre-test $p > 0.110$, while Sig. Based on Mean post-test $p > 0.509$ and for Sig. Based on Median pre-test $p > 0.153$, while Sig. Based on Median post-test $p > 0.490$. Thus, it can be stated that the laerning outcome data has a homogeneous variance. In the context of quasi-experimental research, homogeneity of variance is a crucial foundation to ensure that differences in learning outcomes are not caused by unequal data distribution at the outset (Field, 2013). If the data are not homogeneous, then the interpretation of the treatment effect becomes less valid due to variability bias. Hypothesis testing is used to test the partial effect of

independent variables on the independent variable. The results of the MANOVA hypothesis test can be seen in Table 7.

Table 7. MANOVA Hypothesis Testing Data for Science Process Skills

Variable	Sig. (2-tailed)
Observation	0.313
Classification	0.716
Interpretation	0.031
Hypothesis	0.049

Based on the results data in Table 7 using MANOVA test, the research results show a Sig. (2-tailed) value. The observation indicator $p > 0.313$, classification $p > 0.716$, interpretation $p > 0.031$, and hypothesis $p > 0.049$. Of the four tested indicators, there are two indicators that are not significant, namely the interpretation indicator at 0.031 and the hypothesis at 0.049. In this context, MANOVA allows for a comprehensive analysis of all science process skills indicators observation, classification, interpretation, and hypothesis formulation as an integrated construct. This finding supports (Hosnan, 2014) view that the Discovery Learning model provides opportunities for students to actively participate in scientific processes through exploration and independent discovery. Supported by Nearpod's interactive features, the learning process becomes more contextual, engaging, and effective (Putri & Nugroho, 2022); (Almeida & Simoes, 2019). Therefore, the results in Table 7 confirm that the integration of the Discovery Learning model with Nearpod media has a significant influence on students' science process skills. The criteria for the linear assumption test data can be seen in Table 8 and the hypothesis test in ANCOVA based on the significant values obtained from the SPSS output in Table 9.

Table 8. Test Linear Assumptions Learning Outcomes
Tests of Between-Subjects Effects

Dependent Variable: ***Post-test***					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Class	8.030	1	8.030	.192	0.663
Pretest	10032.979	1	10032.979	239.782	0.000
Class * Pretest	43.449	1	43.449	1.038	0.313
a. R Squared = ,835 (Adjusted R Squared = ,827)					

Based on Table 8 in the class, there is no interaction in the pre-test ($p > 0.05$), indicating that the interpretation of the pre-test does not affect the post-test. According to (Garson, 2012), if the assumption of linearity is violated, the results of ANCOVA may lead to biased conclusions regarding the relationship between variables. Therefore, the findings in Table 8 support the technical validity of the analytical model used in this study to assess the effect of Discovery Learning assisted by Nearpod on students' learning outcomes.

Table 9. ANOCOVA Test Learning Outcomes

Variable	Sig. (2-tailed)
Cognitive Learning Outcomes	0.020

Based on the results data in Table 9 of the study, it was found that the Sig. (2-tailed) value was $0.020 < 0.05$, which indicates that H01 is accepted and Ha1 is rejected. From this, it can be stated that there is a significant effect between the experimental class and the control class using the Discovery Learning model assisted by Nearpod media on the learning outcomes of students at SMA Negeri 01 Palembang. In this study, ANCOVA confirms that the improvement in learning outcomes was not due to initial differences among students, but rather the result of the Discovery Learning

model and the integration of Nearpod. According to , ANCOVA is well-suited for quasi-experimental designs because it statistically isolates the treatment effect from other factors. These findings are supported by (Wulandari, 2022), who found that the use of Nearpod significantly enhanced students' understanding and learning performance in biology classes.

The findings of this study indicate that the Discovery Learning model assisted by Nearpod media significantly improves students' science process skills. This is consistent with the results of (Fahaludin, Fauzi, & Purnamasari, 2016), who stated that "biology learning based on project activities can improve students' science process skills because they are required to directly experience scientific processes such as observing, classifying, measuring, and drawing conclusions." Although the approach used was project-based learning, the core principle of engaging students in active scientific inquiry remains the same. Similarly, in Discovery Learning supported by Nearpod's interactive features, students are encouraged to think critically and independently in constructing scientific concepts. Tools such as 3D simulations and polling features enable students to explore the content actively, thus sharpening their scientific skills more effectively.

The findings of this study indicate that the implementation of the Discovery Learning model assisted by Nearpod significantly improves students' learning outcomes and science process skills in the digestive system topic. This result is supported by the study of (Sukmaningtyas , Madang, & Suratmi, 2018), which demonstrated that the jigsaw cooperative learning model also had a significant effect on enhancing higher-order thinking skills (HOTS) of Grade XI students in the same subject matter. This proves that the use of Discovery Learning aided by Nearpod can facilitate students' scientific activities in a more in-depth and directed manner. Nearpod is capable of bridging the challenges in biology learning. The abstract material of the digestive system, such as chemical and mechanical processes in each organ, becomes easier to understand when presented in an interactive format. This allows students not only to passively receive information but also actively explore, verify, and conclude, enabling them to master science process skills more effectively.

Features in Nearpod such as open-ended questions, polling, and 3D simulations provide an active and meaningful learning experience. Students are not only required to absorb material passively but also to engage directly in an exploration and inquiry-based learning process. For instance, during the problem statement and data collection stage, students actively access visual simulations of the digestive system and pose relevant scientific questions. This process strengthens the development of scientific thinking skills according to the syntax of discovery learning. Based on classroom observations and documentation of student activities, it is evident that students in the experimental class show higher enthusiasm and active participation in completing Nearpod-based tasks compared to the control class that does not use interactive media.

Nearpod provides various features such as Time to Climb, Fill in the Blank, and Open-ended questions that directly support the learning evaluation process in a fun way and motivate students to learn more diligently. The presentation of material through interactive images, videos, and reflective activities via the Draw It feature strengthens students' understanding of complex and abstract concepts of the digestive system. When students can access visual content such as food digestion simulations or the structure of digestive organs in real-time, learning becomes more concrete and easier to understand.

This study shows that the Discovery Learning model assisted by Nearpod positively influences students' learning outcomes on the digestive system material. The integration of interactive features, such as VR, field trip, and 3D simulations, helps students visualize the digestive process more clearly and understand abstract concepts more easily (Wulandari, 2022) (Yuliana, Siregar, & Lestari, 2023). This approach effectively overcomes the limitations of conventional learning and results in more meaningful learning outcomes, as also supported by (Hadi, T,. et al, 2022), who found that Nearpod enhances students' engagement and concept mastery.

Thus, this study shows that the Discovery Learning model assisted by Nearpod has a positive effect on student learning outcomes in the material of the digestive system. This combination of model and interactive media proves to address the weaknesses of conventional learning and brings learning outcomes to a more meaningful level.

CONCLUSION

The Discovery Learning model assisted by Nearpod media has a significant impact on students' science process skills. This is evidenced by the results of the MANOVA test, which showed a significant difference in the indicators of interpretation and hypothesis formulation between the experimental class and the control class. The application of this model allows students to actively engage in the learning process through interactive features such as open-ended questions, polling, and 3D simulations on Nearpod. Students not only observe but also directly engage in interpreting data, designing scientific hypotheses, and formulating conclusions based on independent exploration.

The Nearpod media-assisted Discovery Learning model also has a significant impact on students' learning outcomes. The ANCOVA test results show a significance value of 0.020 ($p < 0.05$), which means there is a significant improvement in the learning outcomes of students in the experimental class compared to the control class. This indicates that learning with Nearpod enables students to better understand the material, remain more focused, and more easily grasp concepts in the digestive system because it is presented visually and interactively.

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REFERENCES

Almeida, F., & Simoes, J. D. (2019). The role of serious games, gamification, and industry 4.0 tools in education. *International Journal of Information and Education Technology*, 9(7), 453-457.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage.

Cut Tiara. (2024). The implementation of problem-based learning supported by TikTok. *Journal of Educational Technology*.

Fahaludin, Fauzi, & Purnamasari. (2016). Pembelajaran berbasis proyek dalam praktikum biologi terhadap keterampilan proses sains siswa SMP Muhammadiyah 6 Palembang. *Bioilmi: Jurnal Pendidikan*, 2(2), 10-22. https://doi.org/10.19109/bioilmi.v2i2

Firdaus, F., Rahmawati, D., & Prasetyo, A. (2019). Penggunaan teknologi pembelajaran dalam meningkatkan hasil belajar biologi. *Jurnal Pendidikan Biologi*, 45-52.

Garson, G. D. (2012). *Testing statistical assumptions.* Statistical Associates Publishing.

Hadi, T,. (2022). Pengaruh penggunaan media Nearpod terhadap motivasi dan hasil belajar peserta didik di SMA. *Jurnal Teknologi Pendidikan*, 45-60.

Hosnan. (2014). *Pendekatan saintifik dan kontekstual dalam pembelajaran abad 21.* Ghalia Indonesia.

Mulyani, A,. (2020). Pengaruh metode ceramah terhadap hasil belajar sains. *Jurnal Pendidikan Sains Indonesia*, 8(1), 45-52.

Nugroho, A. (2022). Pengaruh media pembelajaran Nearpod terhadap motivasi belajar peserta didik. *Jurnal Teknologi Pendidikan*, 15(3), 214-2020.

Priyatno, D. (2014). *Descriptive and inferential statistics using SPSS.* Mediakom.

Putri, R., & Nugroho, A. (2022). The use of Nearpod to enhance student engagement in biology learning. *Journal of Educational Media and Technology*, 10(2), 88-96.

Rahmawati, E. (2019). Dampak pembelajaran berbasis hafalan pada minat belajar siswa. *Jurnal Psikologi Pendidikan*, 5(3), 105-112.

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors, and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, 2(1), 21-33. https://doi.org/10.2139/ssrn.2148823

Rezky, M,. (2022). Developing science process skills through mobile inquiry. *Journal of Biology Education*, 11(1), 1-8.

Sari, L., & Yuliana, T. (2021). Students' difficulties in understanding the digestive system. *Biology Education Journal*, 9(2), 55-62.

Setiawan, H. (2021). Pengaruh media Nearpod terhadap hasil belajar peserta didik pada materi sistem pencernaan. *Jurnal Biologi Pendidikan*, 17(4), 305-312.

Sudjana, N. (2005). *Statistical methods.* Tarsito.

Sukardi, I., Wigati, I., & Masripah, I. (2019). Pengaruh metode pembelajaran Discovery Learning terhadap hasil belajar siswa pada mata pelajaran Biologi kelas VII di MTs Patra Mandiri Plaju Palembang. *Bioilmi: Jurnal Pendidikan*, 6(2). https://doi.org/10.2139/ssrn.2148823

Sukmaningtyas , B., Madang, K., & Suratmi, S. (2018). Pengaruh model pembelajaran kooperatif tipe Jigsaw terhadap berpikir tingkat tinggi (Higher Order Thinking Skills) kelas XI pada materi sistem pencernaan di SMA Negeri 1 Tanjung Raja. *Jurnal Pembelajaran Biologi*, 5(2), 67-74. https://doi.org/10.2139/ssrn.2148823

Surya, R. (2020). Pengaruh model Discovery Learning berbantuan multimedia terhadap keterampilan proses sains, berpikir tingkat tinggi, dan keterampilan bertanya pada materi sistem pernapasan di SMA Negeri 5 Langsa. *Jurnal Biolokus: Jurnal Penelitian Pendidikan Biologi dan Biologi*. https://doi.org/10.30821/biolokus.v3i1.671

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics (7th ed.).* Pearson Education.

Wati, R. (2018). Pengaruh model Discovery Learning terhadap pemahaman konsep sains. *Jurnal Pendidikan Sains*, 10(2), 123-130.

Wulan, D. (2023). *Pengembangan media pembelajaran berbasis Nearpod pada materi keanekaragaman hayati kelas X IPA di SMA/MA.* UIN Raden Fatah Palembang.

Wulandari, A. (2022). Pengaruh Nearpod terhadap hasil belajar dan keterlibatan peserta didik dalam pembelajaran biologi. *Jurnal Pendidikan Sains Indonesia*, 10(1), 12-19.

Yuliana, T., Siregar, D., & Lestari, M. (2023). The integration of Nearpod in biology education: A quasi-experimental study. *Technology and Learning Journal*, 13(2), 122-130.