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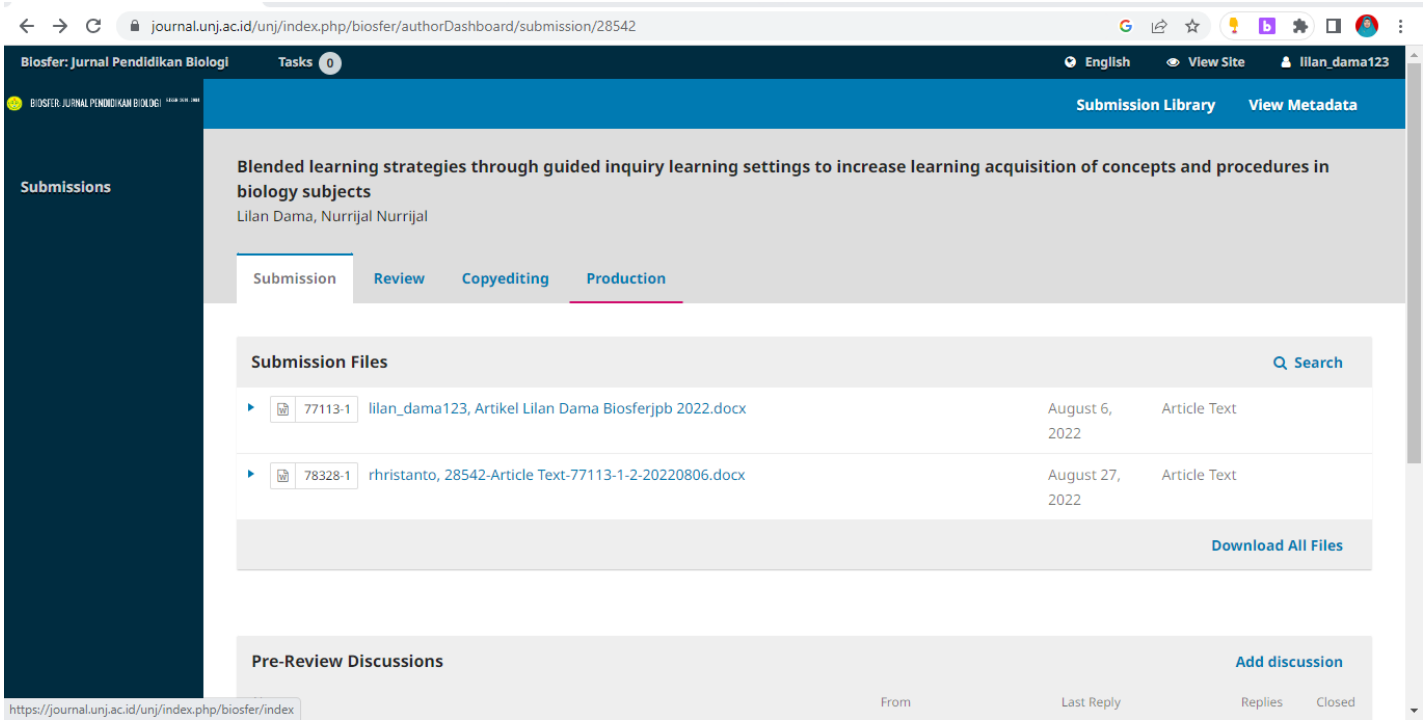
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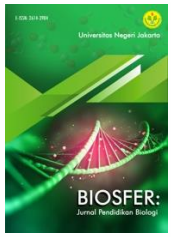

Increasing Learning Acquisition of Concepts and Procedures in Biology Subjects in Senior High Schools Using Blended Learning Setting Strategy Guided Inquiry Learning

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ABSTRACT

The application of blended learning strategies through guided inquiry learning arrangements aims to increase the acquisition of students' learning concepts and procedures on the material of the body's defense system. The purpose of this study was to examine the effect of blended learning strategies with guided inquiry learning settings on the acquisition of learning concepts and procedures in biology subjects in high school. This test was carried out using a pre-experimental one-group pre-post test design, in this design: a) measurement of dependent variables from one group of subjects (pretest), b) subjects were given treatment for a certain period of time (exposure). , c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurements were compared with the results of the posttest measurements. This study involved 36 students of class XI IPA 3 of SMA Negeri 2 Gorontalo, consisting of 22 women and 14 men. The results of this study have an impact on several aspects, namely; (1) Provide scientific experience so that it can become the best practice for fostering student teacher candidates. (2) Contribute directly to schools through teacher partnerships in finding the right learning mode. (3) The blended learning strategy of guided inquiry learning settings is very good in giving effect to increase the acquisition of learning concepts and procedures of students on the material of the body's defense system in Biology subjects in high school.

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INTRODUCTION

The blended learning strategy is an innovation due to distrub that occurs in the world of education. Blended learning is a combination of traditional face-to-face learning and online which has a more flexible time (Su, 2019). This strategy emerged as a response to current technological advances. In line with these advances, encouraging construction to innovate in learning. Both related

to the way teachers teach and how students learn can also influence it. According to (Gillespie et al., 2007) information and communication technology has changed rapidly so that teachers are asked to develop new and innovative ideas from ICT for learning. One of these innovations is virtual learning. So in this situation, the teacher must be truly independent in determining the right way of teaching so that students can find a way of learning that is in accordance with the expected skills and abilities.

Education today requires knowledge, skills, and attitudes, as well as mastery of Information and Communication Technology (ICT). In addition, students are prepared to face global challenges so that higher order thinking skills (HOTS) are needed or in other words education must be able to prepare an educated generation that can compete in the world of work. The use of technology is part of a strategy in learning that can be developed through critical thinking skills and problem solving, communication, creativity, and collaboration. This means that building a virtual learning environment can stimulate higher order thinking skills (HOTS) in students. So what is needed is a combination of learning settings that integrate technology.

But in reality the use of technology in learning in the classroom or outside the classroom is often misused by students. Many students use technology not in essence. Students make information and communication technology in the form of smartphone use often used only for playing social media, games or watching movies. The solution to this problem is to utilize technology into learning settings that package interesting and fun learning models so that they can improve student learning outcomes. Because the completeness of student learning outcomes lies in the acquisition of learning that strengthens concepts and procedures. The acquisition of such learning is a stage in the learning process of students to achieve their learning goals. So that the teacher must be able to design a lesson that can affect the learning process of students. One of the learning models that can affect the learning process of students is the inquiry learning model.

The advantages of guided inquiry learning over other observational learning, which is an approach that is closely related to studying examples that are done (Spector et al., 2014). As explained by Duffy (2009) in (Alfieri et al., 2011), inquiry is a constructivism that emphasizes student motivation and tends to provide guidance or feedback. So that investigation provides a series of questions to be asked and answered (Botturi & Stubbs, 2008). An inquiry approach to teaching science can effectively help students develop critical reasoning capacities, including students' ability to ask scientific and investigative questions, to accurately record and interpret results, in order to relate their findings to growing scientific knowledge (Sutman et al., 2008)). Therefore, guided inquiry plays an important role in mastery of learning that affects the learning process of students. This inquiry tends to affect the acquisition of learning concepts and procedures through HOTS skills, namely; Critical Thinking and Problem Solving Skills, Communication Skills, Creativity and Innovation, and Collaboration. So that utilizing a virtual learning environment (online) is very possible to develop mastery of higher order thinking skills (HOTS).

A robust open-source online learning environment can support guided inquiry, embedded assessment, peer collaboration, interactive computer models, and teacher customization (Spector et al., 2014). Science teaching can be successful if technology is used meaningfully and correctly to assist the development of students' inquiry abilities. Therefore (Practices, 2015), ICT is indispensable in today's science teaching from the perspective of representation of science content and scientific practice. Practices emphasizes that using ICT to assist in science content delivery and the development of students' inquiry skills is important, but knowing students and tracking their learning progress throughout science learning is necessary to make teaching and learning effective and efficient. So that learning that focuses on student inquiry and develops students' abilities and skills to learn and has an emphasis on the use of diverse resources, provides great opportunities for e-learning (Practices, 2015).

In learning biology, the acquisition of learning concepts and procedures is very important. Because concept strengthening is a means to support the acquisition of learning procedures. Mastery of procedures in biology subjects is a concrete learning activity on biological concepts. The results of observations of biology subjects in high school show that biology learning activities have not been carried out and have achieved their goals optimally. Because students are not motivated to be active in learning activities. The impact of such learning problems is found in one of the subjects, namely the

body's defense system. This material investigated is material that is difficult for students to learn because the subject matter is quite complicated. The difficulties experienced by students are due to the material being studied tends to be abstract.

This material requires a higher understanding than the previous material. Many new terms that must be understood by students. In addition, students tend to find it difficult to understand the formation of immunity in the body and the immune processes that occur in the body. This is evidenced by the learning outcomes of students, where not all students achieve the KKM (Minimum Completeness Criteria) so that students who do not pass must take remedial courses. In fact, such problems are converging on the acquisition of learning concepts and procedures.

Based on the description of the problem above, the solution to be applied is to create a virtual learning environment that combines technology into a guided inquiry learning setting. Such a combination is the application of the blended learning strategy of guided inquiry learning settings to the acquisition of learning concepts and procedures in biology subjects. The learning setting places blended learning into a strategy that plays a role in regulating the acquisition of learning concepts and procedures.

METHOD

Research Design

This study was designed using a pre-experimental one-group pre-post test design, in this design are: a) the measurement of dependent variables from one group of subjects (pretest), b) the subject is given treatment for a certain period of time (exposure), c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurement were compared with the posttest measurement results.

Population and Samples

This study involved students of class XI IPA 3 SMA Negeri 2 Gorontalo which is located on Jl. Rambutan, Buladu Village, Kota Barat Subdistrict, Gorontalo City, Gorontalo, totaling 35 people consisting of 22 women and 13 men.

Instrument

The instrument applied aims to measure the acquisition of learning concepts and procedures in the subject of biology in the body's defense system material. The instrument in question is the acquisition of learning outcomes in the form of an acquisition test of learning concepts and procedures consisting of the ability to understand and use concepts and procedures. The test developed to measure the learning achievement is a test in the form of a description or essay. The concept understanding test is to determine the understanding of biological concepts with indicators of knowledge of Bloom's Taxonomy revised by Anderson and Krathwohl, including ability; (1) remember (remember); (2) understand (understand); (3) apply (apply); (4) analyze (analyze); (5) evaluate (evaluate); and (6) create. Procedure text is a text that contains a method, a goal to make or do something step by step in an appropriate sequence so as to produce a desired goal. This text is classified into three types, namely text that contains how to use tools, objects, or the like, text that contains how to do an activity, and text that contains certain habits or characteristics. Procedure text aims to help students understand how to do or make something right.

Procedure

The research procedure carried out on the research subjects included giving a pretest, giving treatment and then doing a posttest after all meetings were carried out. The experimental procedure was arranged starting from the pre-experimental one-group pre-post test design as shown in the following figure.

The One-Group Pretest-Posttest Design

O	X	O
Pretest	Treatment	Posttest

Figure 1. One-Group Pretest-Posttest Research Model

Information:
O = Observation of pretest results
O = Observation of posttest results
X = learning strategy blended learning guided inquiry learning setting

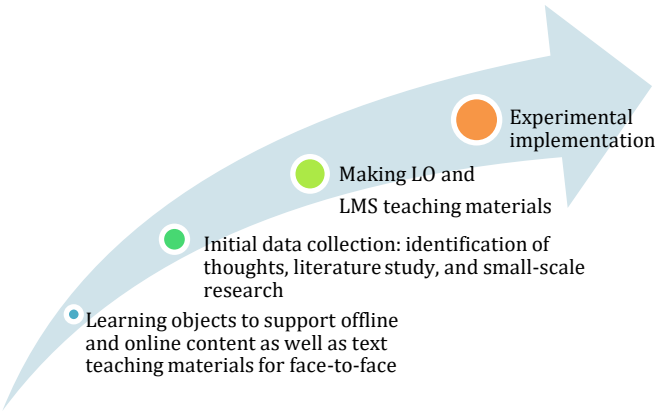

Figure 2. Stages of research procedures

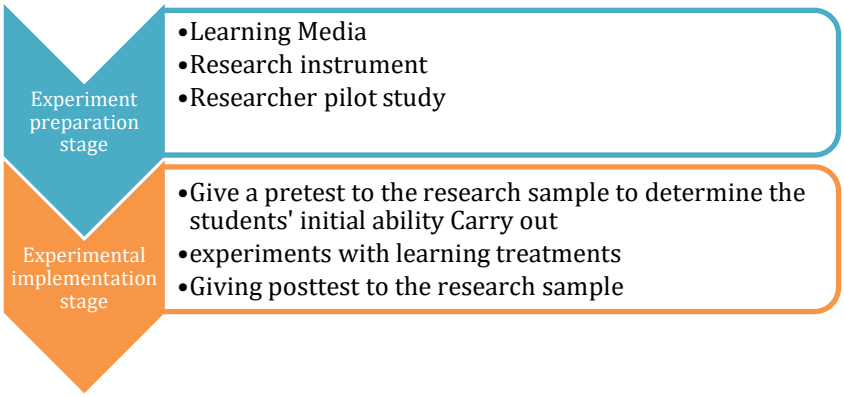

Figure 3. The stage of carrying out the experiment

Data Analysis Techniques

Testing the independent variables on the dependent variable in this study using the T-test through the SPSS application. The steps taken in the technique are;

a. Normality test

The data normality test is a test carried out to determine whether the distribution of the data to be analyzed is normal or not. The normality test used is Kolmogorov-Smirnov using SPSS. The hypotheses in this test are as follows:

H0 : Data is normally distributed
Ha : The data is not normally distributed

If the Kolmogorov-Smirnov significance is more than (sig>0.05), then Ho is accepted so that it can be stated that the data is normally distributed.

b. Homogeneity Test

The homogeneity test was conducted to determine whether the respondent groups taken had the same variance. Homogeneity test using Levene's with = 0.05 and assisted by the SPSS program. If the significance value of F is greater than (sig> 0.05), then Ho is accepted so that it can be stated that the group of respondents whose variance is homogeneous.

c. Hypothesis testing

Based on the formulation of the problem, what is meant by influence is a change from the initial condition and the final condition in this case the final condition is better than the initial condition. That is, the effect test is the same as testing whether the final condition is higher than the initial condition after the application of the blended learning learning strategy in guided inquiry learning settings, the posttest score is better than the pretest. The hypothesis test used aims to test the comparative hypothesis between two different variables, namely between the ability of students to acquire learning concepts and procedures before and after applying the blended learning strategy in guided inquiry learning settings. To find out this value, using a statistical test in the form of a paired t-test (Two Paired Samples Test) in the SPSS program. The hypothesis used is as follows:

H0: There is no effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning concepts and the acquisition of learning procedures.

Ha : There is an effect of the blended learning strategy of guided inquiry learning setting on the acquisition of learning concepts and the acquisition of learning procedures.

RESULT AND DISCUSSION

The results of statistical tests that simultaneously test whether there is an effect on the acquisition of learning concepts and the acquisition of learning procedures on the material of the body's defense system by applying the blended learning strategy of guided inquiry learning settings produce statistical tests with probability values or Sig. the values of the body's defense system are Sig. 0.000 which turns out to be much smaller than the criteria for determining the level of significance (α = 0.05), in connection with which it is stated that there is an influence between learning strategies and the acquisition of learning concepts and the acquisition of learning procedures for system materials. body defense. The conclusion of the test results indicate that the independent variable learning strategy has a strong effect on the two dependent variables simultaneously.

The results of this statistical test lead to further testing, namely testing research hypotheses with a t-test to see the effect of the blended learning strategy of guided inquiry learning settings (independent variable) on the acquisition of learning concepts and procedures for the body's defense system material (bound variable).

a. Concept Learning Acquisition

Based on the results of the first hypothesis test, the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of concept learning resulted in the average value of concept learning acquisition before and after applying the guided inquiry learning setting blended learning strategy, more details as shown in the following table.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	55,97	36	10,199	1,700
	Post Test	74,83	36	14,236	2,373

The output above is a summary of the descriptive statistical results of the two samples measured, namely the pretest score of 55.97 and posttest 74.83 of the 36 students respondents. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average learning outcomes of concepts. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,173	,312

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.173 with a significant value of 0.312 > 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of concept learning

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre Test - Post Test	-18,861	16,011	2,668	-24,278	-13,444	-7,068	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of the acquisition of concept learning at the pretest and the posttest, which means that there is an influence of the blended learning strategy of guided inquiry learning settings on the acquisition of students' concept learning in the body's defense system material.

b. Procedure Learning Acquisition

Based on the results of the second hypothesis test regarding the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning procedures, the average value of the acquisition of learning procedures before and after applying the blended learning strategy of guided inquiry learning settings is shown, in more detail as shown in the following table.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	56,92	36	8,044	1,341
	Post Test	81,19	36	9,704	1,617

The output above explains the summary of the descriptive statistical results of the two samples measured, namely the pretest score for learning procedures is 56.92 and the posttest is 81.19 for 36 students. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average results of learning procedures. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,296	,079

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.296 with a significant value of 0.079> 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of learning procedures.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-24,278	10,612	1,769	-27,868	-20,687	-13,727	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of learning procedural gains in the pretest and posttest, which means that there is an influence of the blended learning strategy learning setting guided inquiry learning on the acquisition of students' learning procedures on the material of the body's defense system.

Based on the results of data analysis and the results of hypothesis testing, it is known that there are differences in the acquisition of learning concepts and procedures of students, in the body defense system material taught before and after using the blended learning strategy in guided inquiry learning settings. By calculating the descriptive test, the acquisition of learning concepts and procedures of students who are taught using the blended learning strategy of guided inquiry learning settings obtain an average score of the acquisition of learning concepts and procedures is higher when compared to the average acquisition of learning concepts and procedures before using the strategy blended learning learning setting guided inquiry learning. This means that the application of blended learning learning strategies in guided inquiry learning settings has a better influence on the acquisition of learning concepts and procedures of students on the material of the body's defense system. These findings prove that the classroom by implementing a blend of learning strategies through the best elements (blended learning) has effectiveness when compared to stand-alone learning strategies, either face-to-face or online (Graham, 2004; Halverson et al., 2017; Hrastinski, 2019).

CONCLUSION

Based on the analysis of the research data, it can be concluded as follows.

1. There is a difference in the acquisition of learning the concept of the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of blended learning learning strategies in guided inquiry learning settings is significantly better in increasing the acquisition of learning concepts than before the implementation of the learning strategy.
2. There is a difference in the acquisition of learning procedures for the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of the blended learning learning strategy in guided inquiry learning settings was significantly better in increasing the acquisition of learning procedures than before the implementation of the learning strategy.

Based on the conclusions above, one general conclusion can be drawn that the blended learning strategy of guided inquiry learning settings is very good in giving an effect on increasing the acquisition of learning concepts and procedures of students in the body defense system material for Biology subjects in high school.

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2. Bukti Konfirmasi Review dan Hasil Review Pertama (11 Des 2022)

[Biosfer] Editor Decision

2022-12-11 01:16 PM

Lilan Dama:

We have reached a decision regarding your submission to Biosfer: Jurnal Pendidikan Biologi, "Increasing Learning Acquisition of Concepts and Procedures in Biology Subjects in Senior High Schools Using Blended Learning Setting Strategy Guided Inquiry Learning".

Our decision is: **Revisions Required**

Could you please revise your manuscript and send back your revised article and **the list of explanations in the Table of the revisions** done through an open journal system of **not more than 10 days**?. Also, **please add a yellow highlight in any changes made to your manuscript**. Please confirm the receipt of this email.

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

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Reviewer A:

Abstract:

research problems have not been raised in the introduction sentence.

conclusions and/or implications of the research have not been conveyed by the author.

Introduction:

please look carefully at your reference metadata.

please clarify the novelty of your research by starting with a gap analysis.

Methods:

please cite your research design reference book.

Please provide your population, sampling technique, and research sample.

Please improve the way information is conveyed regarding data analysis.

Results and Discussion:

You just read your research findings.
You have not discussed the findings.

Your discussion is unclear, too simple, and unscientific.

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please add any recommendations that can be drawn from your research

References:

Please double-check the metadata of all the references you have cited

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Recommendation: Revisions Required

Reviewer B:

Dear author

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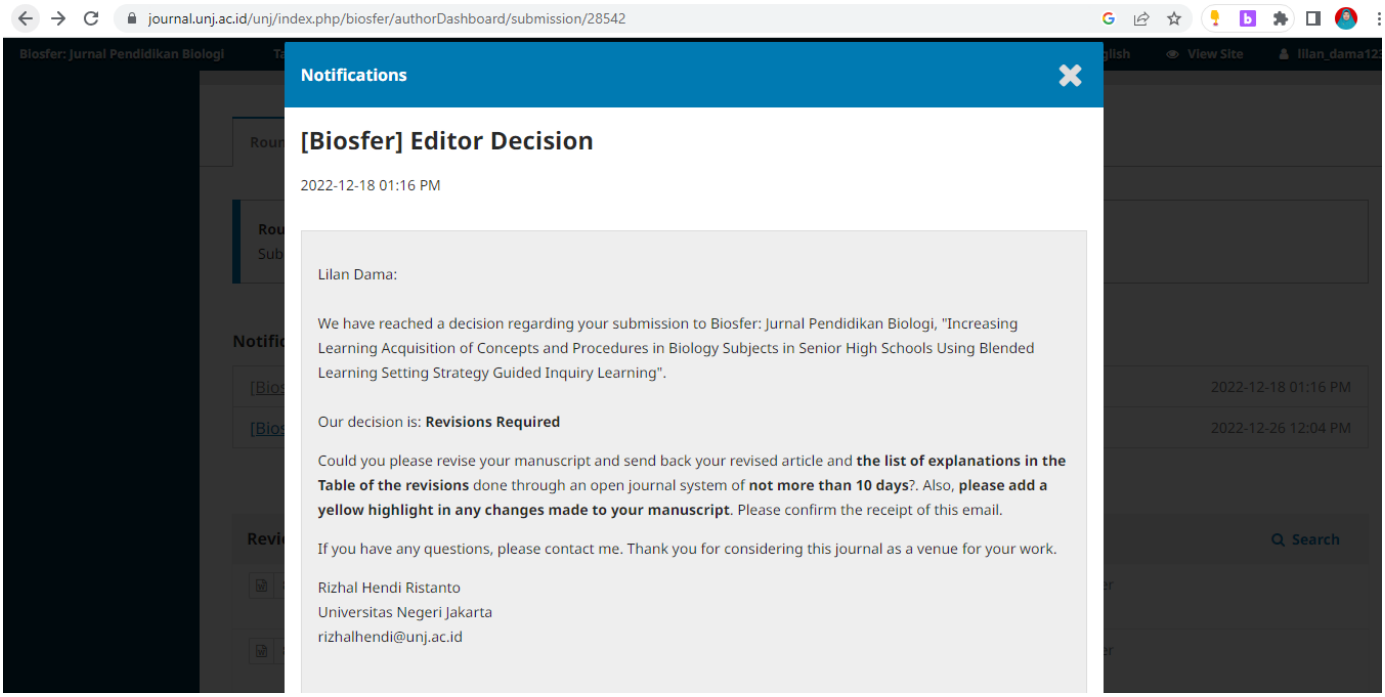
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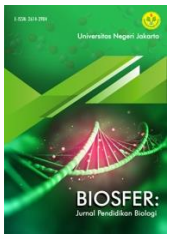

Blended Learning Strategies Through Guided Inquiry Learning Settings To Increase Learning Acquisition Of Concepts And Procedures In Biology Subjects

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ABSTRACT

The application of blended learning strategies through guided inquiry learning arrangements aims to increase the acquisition of students' learning concepts and procedures on the material of the body's defense system. The purpose of this study was to examine the effect of blended learning strategies with guided inquiry learning settings on the acquisition of learning concepts and procedures in biology subjects in high school. This test was carried out using a pre-experimental one-group pre-post test design, in this design: a) measurement of dependent variables from one group of subjects (pretest), b) subjects were given treatment for a certain period of time (exposure). , c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurements were compared with the results of the posttest measurements. This study involved 36 students of second grade of Science class 3 of Public Senior High School 3 Gorontalo, consisting of 22 women and 14 men. The results of this study have an impact on several aspects, namely; (1) Provide scientific experience so that it can become the best practice for fostering student teacher candidates. (2) Contribute directly to schools through teacher partnerships in finding the right learning mode. (3) The blended learning strategy of guided inquiry learning settings is very good in giving effect to increase the acquisition of learning concepts and procedures of students on the material of the body's defense system in Biology subjects in high school.

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INTRODUCTION

The blended learning strategy is an innovation due to distrub that occurs in the world of education. Blended learning is a combination of traditional face-to-face learning and online which has a more flexible time (Su, 2019). This strategy emerged as a response to current technological advances. In line with these advances, encouraging construction to innovate in learning. Both related to the way teachers teach and how students learn can also influence it. According to (Gillespie et al., 2007) information and communication technology has changed rapidly so that teachers are asked to

develop new and innovative ideas from ICT for learning. One of these innovations is virtual learning. So in this situation, the teacher must be truly independent in determining the right way of teaching so that students can find a way of learning that is in accordance with the expected skills and abilities.

Education today requires knowledge, skills, and attitudes, as well as mastery of Information and Communication Technology (ICT). In addition, students are prepared to face global challenges so that higher order thinking skills (HOTS) are needed or in other words education must be able to prepare an educated generation that can compete in the world of work. The use of technology is part of a strategy in learning that can be developed through critical thinking skills and problem solving, communication, creativity, and collaboration. This means that building a virtual learning environment can stimulate higher order thinking skills (HOTS) in students. So what is needed is a combination of learning settings that integrate technology (Dewi, D. R., 2019; Yusuf, I., & Widyaningsih, S. W., 2022).

But in reality the use of technology in learning in the classroom or outside the classroom is often misused by students. Many students use technology not in essence. Students make information and communication technology in the form of smartphone use often used only for playing social media, games or watching movies. The solution to this problem is to utilize technology into learning settings that package interesting and fun learning models so that they can improve student learning outcomes. Because the completeness of student learning outcomes lies in the acquisition of learning that strengthens concepts and procedures. The acquisition of such learning is a stage in the learning process of students to achieve their learning goals. So that the teacher must be able to design a lesson that can affect the learning process of students. One of the learning models that can affect the learning process of students is the inquiry learning model.

The advantages of guided inquiry learning over other observational learning, which is an approach that is closely related to studying examples that are done (Spector et al., 2014). The use of guided inquiry models in the learning process can assist students in solving a problem, because through this model students can find information on their own through discovery so that the understanding of the material that students get will be more meaningful and easily absorbed by students. As explained by Duffy (2009) in (Alfieri et al., 2011), inquiry is a constructivism that emphasizes student motivation and tends to provide guidance or feedback. So that investigation provides a series of questions to be asked and answered (Botturi & Stubbs, 2008). An inquiry approach to teaching science can effectively help students develop critical reasoning capacities, including students' ability to ask scientific and investigative questions, to accurately record and interpret results, in order to relate their findings to growing scientific knowledge (Sutman et al., 2008). Therefore, guided inquiry plays an important role in mastery of learning that affects the learning process of students. This inquiry tends to affect the acquisition of learning concepts and procedures through HOTS skills, namely; Critical Thinking and Problem Solving Skills, Communication Skills, Creativity and Innovation, and Collaboration (Islami, D. F., & Fitri, R., 2021). So that utilizing a virtual learning environment (online) is very possible to develop mastery of higher order thinking skills (HOTS).

A robust open-source online learning environment can support guided inquiry, embedded assessment, peer collaboration, interactive computer models, and teacher customization (Spector et al., 2014). Science teaching can be successful if technology is used meaningfully and correctly to assist the development of students' inquiry abilities. Therefore (Practices, 2015), ICT is indispensable in today's science teaching from the perspective of representation of science content and scientific practice. Practices emphasizes that using ICT to assist in science content delivery and the development of students' inquiry skills is important, but knowing students and tracking their learning progress throughout science learning is necessary to make teaching and learning effective and efficient. So that learning that focuses on student inquiry and develops students' abilities and skills to learn and has an emphasis on the use of diverse resources, provides great opportunities for e-learning (Practices, 2015).

In learning biology, the acquisition of learning concepts and procedures is very important. Because concept strengthening is a means to support the acquisition of learning procedures. Mastery of procedures in biology subjects is a concrete learning activity on biological concepts. The results of observations of biology subjects in high school show that biology learning activities have not been carried out and have achieved their goals optimally. Because students are not motivated to be active in learning activities. The impact of such learning problems is found in one of the subjects, namely the body's defense system. This material investigated is material that is difficult for students to learn

because the subject matter is quite complicated. The difficulties experienced by students are due to the material being studied tends to be abstract.

This material requires a higher understanding than the previous material. Many new terms that must be understood by students. In addition, students tend to find it difficult to understand the formation of immunity in the body and the immune processes that occur in the body. This is evidenced by the learning outcomes of students, where not all students achieve the KKM (Minimum Completeness Criteria) so that students who do not pass must take remedial courses. In fact, such problems are converging on the acquisition of learning concepts and procedures.

Based on the description of the problem above, the solution to be applied is to create a virtual learning environment that combines technology into a guided inquiry learning setting. Such a combination is the application of the blended learning strategy of guided inquiry learning settings to the acquisition of learning concepts and procedures in biology subjects. The learning setting places blended learning into a strategy that plays a role in regulating the acquisition of learning concepts and procedures.

METHOD

Research Design

This study was designed using a pre-experimental one-group pre-post test design, in this design are: a) the measurement of dependent variables from one group of subjects (pretest), b) the subject is given treatment for a certain period of time (exposure), c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurement were compared with the posttest measurement results.

Population and Samples

This study involved students of class XI IPA 3 SMA Negeri 2 Gorontalo which is located on Jl. Rambutan, Buladu Village, Kota Barat Subdistrict, Gorontalo City, Gorontalo, totaling 35 people consisting of 22 women and 13 men.

Instrument

The instrument applied aims to measure the acquisition of learning concepts and procedures in the subject of biology in the body's defense system material. The instrument in question is the acquisition of learning outcomes in the form of an acquisition test of learning concepts and procedures consisting of the ability to understand and use concepts and procedures. The test developed to measure the learning achievement is a test in the form of a description or essay. The concept understanding test is to determine the understanding of biological concepts with indicators of knowledge of Bloom's Taxonomy revised by Anderson and Krathwohl, including ability; (1) remember (remember); (2) understand (understand); (3) apply (apply); (4) analyze (analyze); (5) evaluate (evaluate); and (6) create. Procedure text is a text that contains a method, a goal to make or do something step by step in an appropriate sequence so as to produce a desired goal. This text is classified into three types, namely text that contains how to use tools, objects, or the like, text that contains how to do an activity, and text that contains certain habits or characteristics. Procedure text aims to help students understand how to do or make something right (Table 1).

Table 1. Research Instrument

Concept Learning Acquisition Test	Procedure Text
1. Essay Test / Description The concept understanding test is to find out the understanding of biological concepts	1. The text contains how to use tools, objects, or the like 2. The text contains how to do an activity 3. text that contains certain habits or characteristics

Procedure

The research procedure carried out on the research subjects included giving a pretest, giving treatment and then doing a posttest after all meetings were carried out. The experimental procedure was arranged starting from the pre-experimental one-group pre-post test design as shown in the following figure.

The One-Group Pretest-Posttest Design

O	X	O
Pretest	Treatment	Posttest

Figure 1. One-Group Pretest-Posttest Research Model

Information:
O = Observation of pretest results
O = Observation of posttest results
X = learning strategy blended learning guided inquiry learning setting

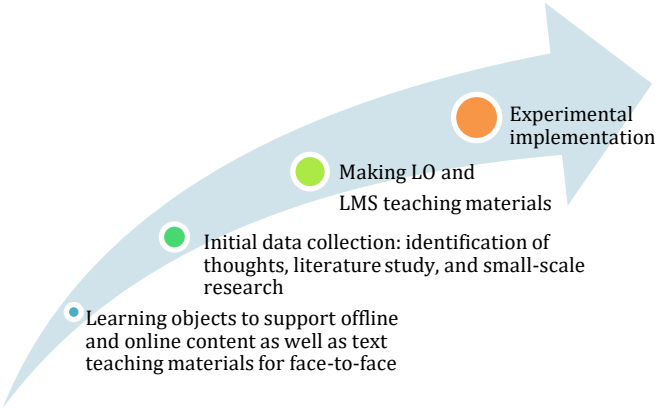

Figure 2. Stages of research procedures

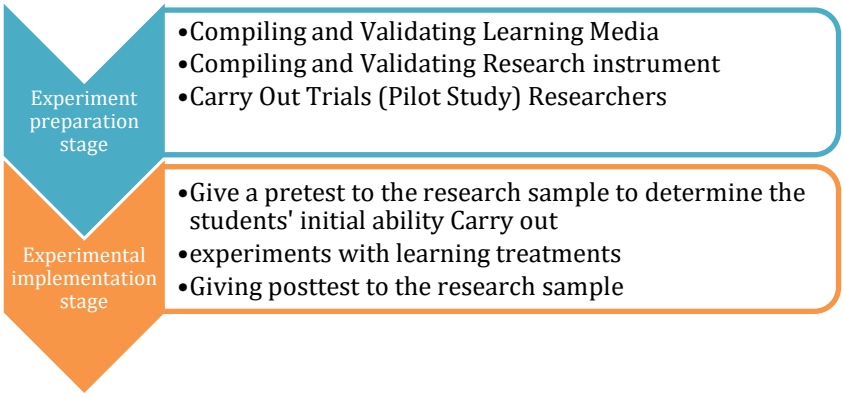

Figure 3. The stage of carrying out the experiment

Data Analysis Techniques

Testing the independent variables on the dependent variable in this study using the T-test through the SPSS application. The steps taken in the technique are;

d. Normality test

The data normality test is a test carried out to determine whether the distribution of the data to be analyzed is normal or not. The normality test used is Kolmogorov-Smirnov using SPSS. The hypotheses in this test are as follows:

H0 : Data is normally distributed

Ha : The data is not normally distributed

If the Kolmogorov-Smirnov significance is more than (sig>0.05), then Ho is accepted so that it can be stated that the data is normally distributed.

e. Homogeneity Test

The homogeneity test was conducted to determine whether the respondent groups taken had the same variance. Homogeneity test using Levene's with = 0.05 and assisted by the SPSS program. If the significance value of F is greater than (sig> 0.05), then Ho is accepted so that it can be stated that the group of respondents whose variance is homogeneous.

f. Hypothesis testing

Based on the formulation of the problem, what is meant by influence is a change from the initial condition and the final condition in this case the final condition is better than the initial condition. That is, the effect test is the same as testing whether the final condition is higher than the initial condition after the application of the blended learning learning strategy in guided inquiry learning settings, the posttest score is better than the pretest. The hypothesis test used aims to test the comparative hypothesis between two different variables, namely between the ability of students to acquire learning concepts and procedures before and after applying the blended learning strategy in guided inquiry learning settings. To find out this value, using a statistical test in the form of a paired t-test (Two Paired Samples Test) in the SPSS program. The hypothesis used is as follows:

H0: There is no effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning concepts and the acquisition of learning procedures.

Ha : There is an effect of the blended learning strategy of guided inquiry learning setting on the acquisition of learning concepts and the acquisition of learning procedures.

RESULT AND DISCUSSION

The results of statistical tests that simultaneously test whether there is an effect on the acquisition of learning concepts and the acquisition of learning procedures on the material of the body's defense system by applying the blended learning strategy of guided inquiry learning settings produce statistical tests with probability values or Sig. the values of the body's defense system are Sig. 0.000 which turns out to be much smaller than the criteria for determining the level of significance (α = 0.05), in connection with which it is stated that there is an influence between learning strategies and the acquisition of learning concepts and the acquisition of learning procedures for system materials. body defense. The conclusion of the test results indicate that the independent variable learning strategy has a strong effect on the two dependent variables simultaneously.

c. Concept Learning Acquisition

Based on the results of the first hypothesis test, the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of concept learning resulted in the average value of concept learning acquisition before and after applying the guided inquiry learning setting blended learning strategy, more details as shown in the following table 2.

Table 2. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	55,97	36	10,199	1,700
	Post Test	74,83	36	14,236	2,373

The output above is a summary of the descriptive statistical results of the two samples measured, namely the pretest score of 55.97 and posttest 74.83 of the 36 students respondents. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average learning outcomes of concepts. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 3).

Table 3. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,173	,312

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.173 with a significant value of 0.312 > 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of concept learning (Table 4)

Table 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-18,861	16,011	2,668	-24,278	-13,444	-7,068	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of the acquisition of concept learning at the pretest and the posttest, which means that there is an influence of the blended learning strategy of guided inquiry learning settings on the acquisition of students' concept learning in the body's defense system material.

d. Procedure Learning Acquisition

Based on the results of the second hypothesis test regarding the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning procedures, the average value of the acquisition of learning procedures before and after applying the blended learning strategy of guided inquiry learning settings is shown, in more detail as shown in the following table 5.

Table 5. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	56,92	36	8,044	1,341
	Post Test	81,19	36	9,704	1,617

The output above explains the summary of the descriptive statistical results of the two samples measured, namely the pretest score for learning procedures is 56.92 and the posttest is 81.19 for 36 students. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average results of learning procedures. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 6).

Table 6. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,296	,079

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.296 with a

significant value of 0.079> 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of learning procedures below (Table 7).

Table 7. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-24,278	10,612	1,769	-27,868	-20,687	-13,727	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of learning procedural gains in the pretest and posttest, which means that there is an influence of the blended learning strategy learning setting guided inquiry learning on the acquisition of students' learning procedures on the material of the body's defense system. Based on the results of data analysis and the results of hypothesis testing, it is known that there are differences in the acquisition of learning concepts and procedures of students, in the body defense system material taught before and after using the blended learning strategy in guided inquiry learning settings. By calculating the descriptive test, the acquisition of learning concepts and procedures of students who are taught using the blended learning strategy of guided inquiry learning settings obtain an average score of the acquisition of learning concepts and procedures is higher when compared to the average acquisition of learning concepts and procedures before using the strategy blended learning learning setting guided inquiry learning. This means that the application of blended learning learning strategies in guided inquiry learning settings has a better influence on the acquisition of learning concepts and procedures of students on the material of the body's defense system. These findings prove that the classroom by implementing a blend of learning strategies through the best elements (blended learning) has effectiveness when compared to stand-alone learning strategies, either face-to-face or online (Graham, 2004; Halverson et al., 2017; Hrastinski, 2019).

CONCLUSION

Based on the analysis of the research data, it can be concluded that 1) There is a difference in the acquisition of learning the concept of the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of blended learning learning strategies in guided inquiry learning settings is significantly better in increasing the acquisition of learning concepts than before the implementation of the learning strategy; 2) There is a difference in the acquisition of learning procedures for the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of the blended learning learning strategy in guided inquiry learning settings was significantly better in increasing the acquisition of learning procedures than before the implementation of the learning strategy.

Based on the conclusions above, one general conclusion can be drawn that the blended learning strategy of guided inquiry learning settings is very good in giving an effect on increasing the acquisition of learning concepts and procedures of students in the body defense system material for Biology subjects in high school.

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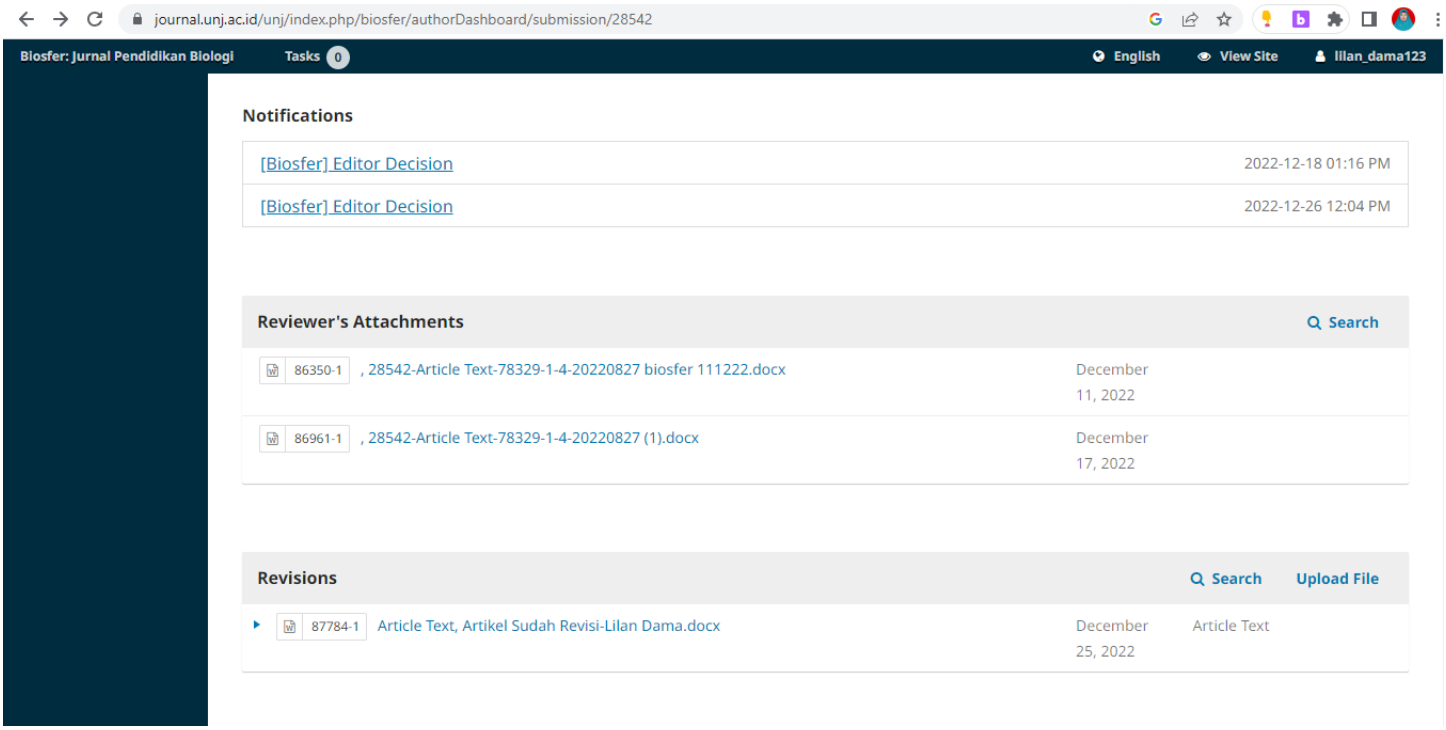
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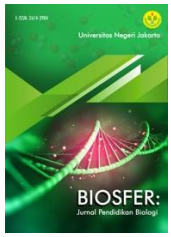

Blended Learning Strategies Through Guided Inquiry Learning Settings To Increase Learning Acquisition Of Concepts And Procedures In Biology Subjects

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ABSTRACT

The application of blended learning strategies through guided inquiry learning arrangements aims to increase the acquisition of students' learning concepts and procedures on the material of the body's defense system. The purpose of this study was to examine the effect of blended learning strategies with guided inquiry learning settings on the acquisition of learning concepts and procedures in biology subjects in high school. This test was carried out using a pre-experimental one-group pre-post test design, in this design: a) measurement of dependent variables from one group of subjects (pretest), b) subjects were given treatment for a certain period of time (exposure). , c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurements were compared with the results of the posttest measurements. This study involved 36 students of second grade of Science class 3 of Public Senior High School 3 Gorontalo, consisting of 22 women and 14 men. The results of this study have an impact on several aspects, namely; (1) Provide scientific experience so that it can become the best practice for fostering student teacher candidates. (2) Contribute directly to schools through teacher partnerships in finding the right learning mode. (3) The blended learning strategy of guided inquiry learning settings is very good in giving effect to increase the acquisition of learning concepts and procedures of students on the material of the body's defense system in Biology subjects in high school.

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INTRODUCTION

The blended learning strategy is an innovation due to distrub that occurs in the world of education. Blended learning is a combination of traditional face-to-face learning and online which has a more flexible time (Su, 2019). This strategy emerged as a response to current technological advances. In line with these advances, encouraging construction to innovate in learning. Both related to the way teachers teach and how students learn can also influence it. According to (Gillespie et al., 2007) information and communication technology has changed rapidly so that

teachers are asked to develop new and innovative ideas from ICT for learning. One of these innovations is virtual learning. So in this situation, the teacher must be truly independent in determining the right way of teaching so that students can find a way of learning that is in accordance with the expected skills and abilities.

Education today requires knowledge, skills, and attitudes, as well as mastery of Information and Communication Technology (ICT). In addition, students are prepared to face global challenges so that higher order thinking skills (HOTS) are needed or in other words education must be able to prepare an educated generation that can compete in the world of work. The use of technology is part of a strategy in learning that can be developed through critical thinking skills and problem solving, communication, creativity, and collaboration. This means that building a virtual learning environment can stimulate higher order thinking skills (HOTS) in students. So what is needed is a combination of learning settings that integrate technology (Dewi, D. R., 2019; Yusuf, I., & Widyaningsih, S. W., 2022).

But in reality the use of technology in learning in the classroom or outside the classroom is often misused by students. Many students use technology not in essence. Students make information and communication technology in the form of smartphone use often used only for playing social media, games or watching movies. The solution to this problem is to utilize technology into learning settings that package interesting and fun learning models so that they can improve student learning outcomes. Because the completeness of student learning outcomes lies in the acquisition of learning that strengthens concepts and procedures. The acquisition of such learning is a stage in the learning process of students to achieve their learning goals. So that the teacher must be able to design a lesson that can affect the learning process of students. One of the learning models that can affect the learning process of students is the inquiry learning model.

The advantages of guided inquiry learning over other observational learning, which is an approach that is closely related to studying examples that are done (Spector et al., 2014). The use of guided inquiry models in the learning process can assist students in solving a problem, because through this model students can find information on their own through discovery so that the understanding of the material that students get will be more meaningful and easily absorbed by students. As explained by Duffy (2009) in (Alfieri et al., 2011), inquiry is a constructivism that emphasizes student motivation and tends to provide guidance or feedback. So that investigation provides a series of questions to be asked and answered (Botturi & Stubbs, 2008). An inquiry approach to teaching science can effectively help students develop critical reasoning capacities, including students' ability to ask scientific and investigative questions, to accurately record and interpret results, in order to relate their findings to growing scientific knowledge (Sutman et al., 2008). Therefore, guided inquiry plays an important role in mastery of learning that affects the learning process of students. This inquiry tends to affect the acquisition of learning concepts and procedures through HOTS skills, namely; Critical Thinking and Problem Solving Skills, Communication Skills, Creativity and Innovation, and Collaboration (Islami, D. F., & Fitri, R., 2021). So that utilizing a virtual learning environment (online) is very possible to develop mastery of higher order thinking skills (HOTS).

A robust open-source online learning environment can support guided inquiry, embedded assessment, peer collaboration, interactive computer models, and teacher customization (Spector et al., 2014). Science teaching can be successful if technology is used meaningfully and correctly to assist the development of students' inquiry abilities. Therefore (Practices, 2015), ICT is indispensable in today's science teaching from the perspective of representation of science content and scientific practice. Practices emphasizes that using ICT to assist in science content delivery and the development of students' inquiry skills is important, but knowing students and tracking their learning progress throughout science learning is necessary to make teaching and learning effective and efficient. So that learning that focuses on student inquiry and develops students' abilities and skills to learn and has an emphasis on the use of diverse resources, provides great opportunities for e-learning (Practices, 2015).

In learning biology, the acquisition of learning concepts and procedures is very important. Because concept strengthening is a means to support the acquisition of learning procedures. Mastery of procedures in biology subjects is a concrete learning activity on biological concepts. The

results of observations of biology subjects in high school show that biology learning activities have not been carried out and have achieved their goals optimally. Because students are not motivated to be active in learning activities. The impact of such learning problems is found in one of the subjects, namely the body's defense system. This material investigated is material that is difficult for students to learn because the subject matter is quite complicated. The difficulties experienced by students are due to the material being studied tends to be abstract.

This material requires a higher understanding than the previous material. Many new terms that must be understood by students. In addition, students tend to find it difficult to understand the formation of immunity in the body and the immune processes that occur in the body. This is evidenced by the learning outcomes of students, where not all students achieve the KKM (Minimum Completeness Criteria) so that students who do not pass must take remedial courses. In fact, such problems are converging on the acquisition of learning concepts and procedures.

Based on the description of the problem above, the solution to be applied is to create a virtual learning environment that combines technology into a guided inquiry learning setting. Such a combination is the application of the blended learning strategy of guided inquiry learning settings to the acquisition of learning concepts and procedures in biology subjects. The learning setting places blended learning into a strategy that plays a role in regulating the acquisition of learning concepts and procedures.

METHOD

Research Design

This study was designed using a pre-experimental one-group pre-post test design, in this design are: a) the measurement of dependent variables from one group of subjects (pretest), b) the subject is given treatment for a certain period of time (exposure), c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurement were compared with the posttest measurement results.

Population and Samples

This study involved students of class XI IPA 3 SMA Negeri 2 Gorontalo which is located on Jl. Rambutan, Buladu Village, Kota Barat Subdistrict, Gorontalo City, Gorontalo, totaling 35 people consisting of 22 women and 13 men.

Instrument

The instrument applied aims to measure the acquisition of learning concepts and procedures in the subject of biology in the body's defense system material. The instrument in question is the acquisition of learning outcomes in the form of an acquisition test of learning concepts and procedures consisting of the ability to understand and use concepts and procedures. The test developed to measure the learning achievement is a test in the form of a description or essay. The concept understanding test is to determine the understanding of biological concepts with indicators of knowledge of Bloom's Taxonomy revised by Anderson and Krathwohl, including ability; (1) remember (remember); (2) understand (understand); (3) apply (apply); (4) analyze (analyze); (5) evaluate (evaluate); and (6) create. Procedure text is a text that contains a method, a goal to make or do something step by step in an appropriate sequence so as to produce a desired goal. This text is classified into three types, namely text that contains how to use tools, objects, or the like, text that contains how to do an activity, and text that contains certain habits or characteristics. Procedure text aims to help students understand how to do or make something right (Table 1).

Table 1. Research Instrument

Concept Learning Acquisition Test	Procedure Text
1. Essay Test / Description The concept understanding test is to find out the understanding of biological concepts	1. The text contains how to use tools, objects, or the like 2. The text contains how to do an activity 3. text that contains certain habits or characteristics

Procedure

The research procedure carried out on the research subjects included giving a pretest, giving treatment and then doing a posttest after all meetings were carried out. The experimental procedure was arranged starting from the pre-experimental one-group pre-post test design as shown in the following figure.

The One-Group Pretest-Posttest Design

O	X	O
Pretest	Treatment	Posttest

Figure 1. One-Group Pretest-Posttest Research Model

Information:
O = Observation of pretest results
O = Observation of posttest results
X = learning strategy blended learning guided inquiry learning setting

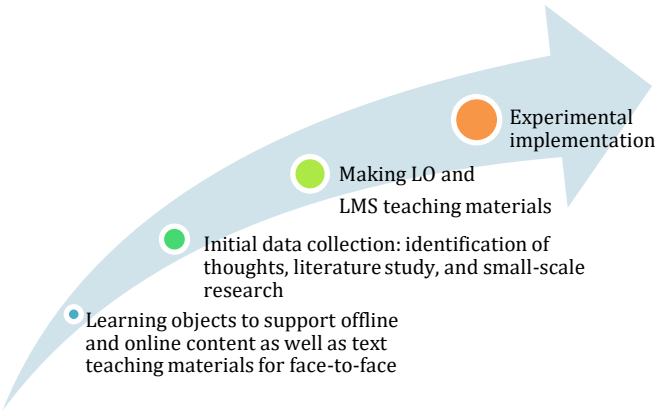

Figure 2. Stages of research procedures

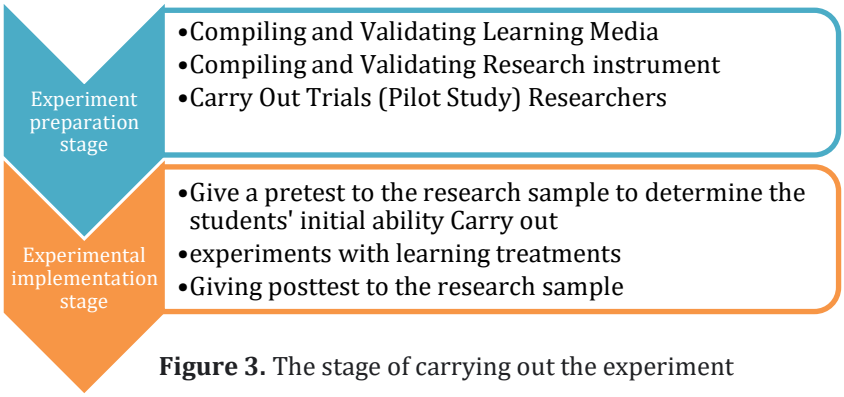

Figure 3. The stage of carrying out the experiment

Data Analysis Techniques

Testing the independent variables on the dependent variable in this study using the T-test through the SPSS application. The steps taken in the technique are;

g. Normality test

The data normality test is a test carried out to determine whether the distribution of the data to be analyzed is normal or not. The normality test used is Kolmogorov-Smirnov using SPSS. The hypotheses in this test are as follows:

H0 : Data is normally distributed

Ha : The data is not normally distributed

If the Kolmogorov-Smirnov significance is more than (sig>0.05), then Ho is accepted so that it can be stated that the data is normally distributed.

h. Homogeneity Test

The homogeneity test was conducted to determine whether the respondent groups taken had the same variance. Homogeneity test using Levene's with = 0.05 and assisted by the SPSS program. If the significance value of F is greater than (sig> 0.05), then Ho is accepted so that it can be stated that the group of respondents whose variance is homogeneous.

i. Hypothesis testing

Based on the formulation of the problem, what is meant by influence is a change from the initial condition and the final condition in this case the final condition is better than the initial condition. That is, the effect test is the same as testing whether the final condition is higher than the initial condition after the application of the blended learning learning strategy in guided inquiry learning settings, the posttest score is better than the pretest. The hypothesis test used aims to test the comparative hypothesis between two different variables, namely between the ability of students to acquire learning concepts and procedures before and after applying the blended learning strategy in guided inquiry learning settings. To find out this value, using a statistical test in the form of a paired t-test (Two Paired Samples Test) in the SPSS program. The hypothesis used is as follows:

H0: There is no effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning concepts and the acquisition of learning procedures.

Ha : There is an effect of the blended learning strategy of guided inquiry learning setting on the acquisition of learning concepts and the acquisition of learning procedures.

RESULT AND DISCUSSION

The results of statistical tests that simultaneously test whether there is an effect on the acquisition of learning concepts and the acquisition of learning procedures on the material of the body's defense system by applying the blended learning strategy of guided inquiry learning settings produce statistical tests with probability values or Sig. the values of the body's defense system are Sig. 0.000 which turns out to be much smaller than the criteria for determining the level of significance ($\alpha = 0.05$), in connection with which it is stated that there is an influence between learning strategies and the acquisition of learning concepts and the acquisition of learning procedures for system materials. body defense. The conclusion of the test results indicate that the independent variable learning strategy has a strong effect on the two dependent variables simultaneously.

e. Concept Learning Acquisition

Based on the results of the first hypothesis test, the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of concept learning resulted in the average value of concept learning acquisition before and after applying the guided inquiry learning setting blended learning strategy, more details as shown in the following table 2.

Table 2. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	55,97	36	10,199	1,700
	Post Test	74,83	36	14,236	2,373

The output above is a summary of the descriptive statistical results of the two samples measured, namely the pretest score of 55.97 and posttest 74.83 of the 36 students respondents. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average learning outcomes of concepts. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 3).

Table 3. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,173	,312

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.173 with a significant value of 0.312 > 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of concept learning (Table 4)

Table 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-18,861	16,011	2,668	-24,278	-13,444	-7,068	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of the acquisition of concept learning at the pretest and the posttest, which means that there is an influence of the blended learning strategy of guided inquiry learning settings on the acquisition of students' concept learning in the body's defense system material.

f. Procedure Learning Acquisition

Based on the results of the second hypothesis test regarding the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning procedures, the average value of the acquisition of learning procedures before and after applying the blended learning strategy of guided inquiry learning settings is shown, in more detail as shown in the following table 5.

Table 5. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	56,92	36	8,044	1,341
	Post Test	81,19	36	9,704	1,617

The output above explains the summary of the descriptive statistical results of the two samples measured, namely the pretest score for learning procedures is 56.92 and the posttest is 81.19 for 36 students. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average results of learning procedures. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 6).

Table 6. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,296	,079

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.296 with a significant value of 0.079> 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of learning procedures below (Table 7).

Table 7. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-24,278	10,612	1,769	-27,868	-20,687	-13,727	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of learning procedural gains in the pretest and posttest, which means that there is an influence of the blended learning strategy learning setting guided inquiry learning on the acquisition of students' learning procedures on the material of the body's defense system. Based on the results of data analysis and the results of hypothesis testing, it is known that there are differences in the acquisition of learning concepts and procedures of students, in the body defense system material taught before and after using the blended learning strategy in guided inquiry learning settings. By calculating the descriptive test, the acquisition of learning concepts and procedures of students who are taught using the blended learning strategy of guided inquiry learning settings obtain an average score of the acquisition of learning concepts and procedures is higher when compared to the average acquisition of learning concepts and procedures before using the strategy blended learning learning setting guided inquiry learning. This means that the application of blended learning learning strategies in guided inquiry learning settings has a better influence on the acquisition of learning concepts and procedures of students on the material of the body's defense system. These findings prove that the classroom by implementing a blend of learning strategies through the best elements (blended learning) has effectiveness when compared to stand-alone learning strategies, either face-to-face or online (Graham, 2004; Halverson et al., 2017; Hrastinski, 2019).

CONCLUSION

Based on the analysis of the research data, it can be concluded that 1) There is a difference in the acquisition of learning the concept of the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of blended learning learning strategies in guided inquiry learning settings is significantly better in increasing the acquisition of learning concepts than before the implementation of the learning strategy; 2)

There is a difference in the acquisition of learning procedures for the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of the blended learning learning strategy in guided inquiry learning settings was significantly better in increasing the acquisition of learning procedures than before the implementation of the learning strategy.

Based on the conclusions above, one general conclusion can be drawn that the blended learning strategy of guided inquiry learning settings is very good in giving an effect on increasing the acquisition of learning concepts and procedures of students in the body defense system material for Biology subjects in high school.

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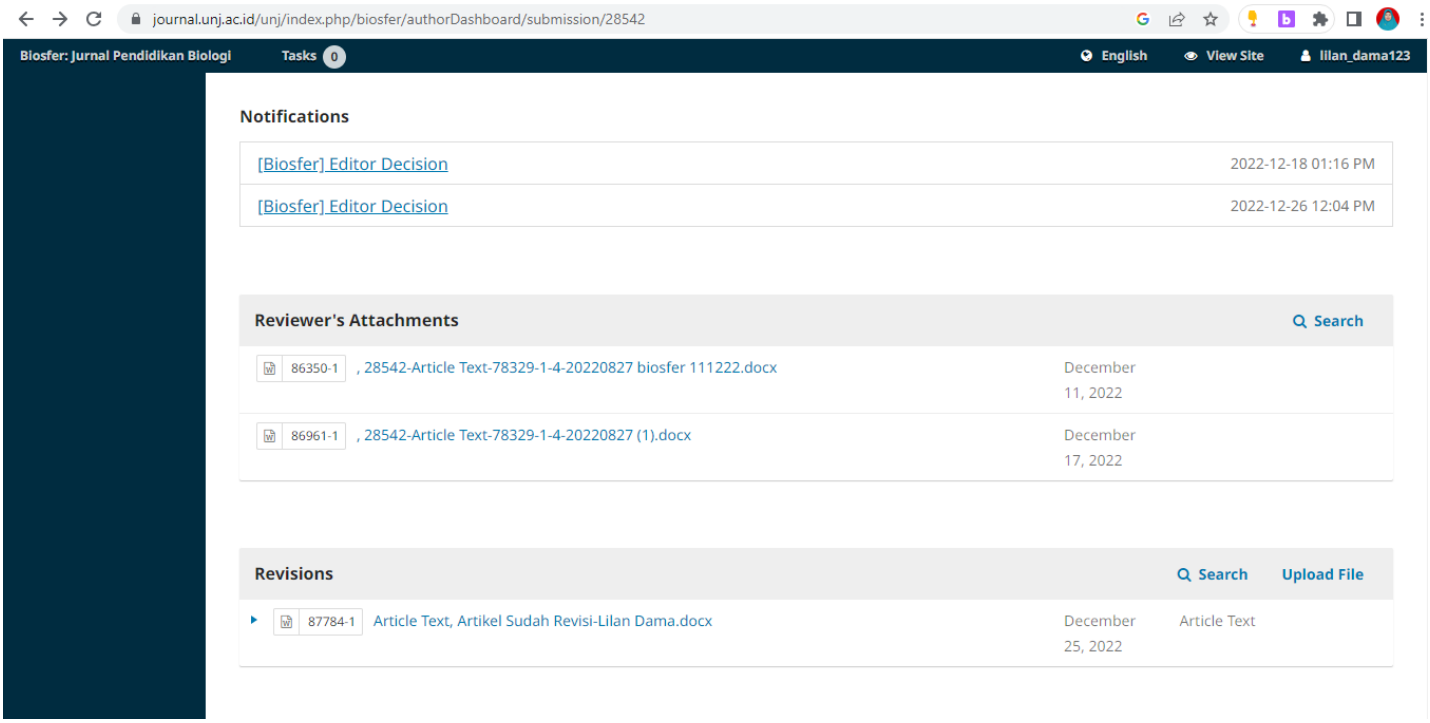
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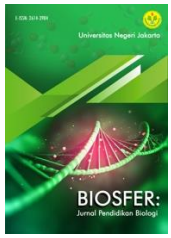

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The application of blended learning strategies through guided inquiry learning arrangements aims to increase the acquisition of students' learning concepts and procedures on the material of the body's defense system. The purpose of this study was to examine the effect of blended learning strategies with guided inquiry learning settings on the acquisition of learning concepts and procedures in biology subjects in high school. This test was carried out using a pre-experimental one-group pre-post test design, in this design: a) measurement of dependent variables from one group of subjects (pretest), b) subjects were given treatment for a certain period of time (exposure). , c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurements were compared with the results of the posttest measurements. This study involved 36 students of second grade of Science class 3 of Public Senior High School 3 Gorontalo, consisting of 22 women and 14 men. The results of this study have an impact on several aspects, namely; (1) Provide scientific experience so that it can become the best practice for fostering student teacher candidates. (2) Contribute directly to schools through teacher partnerships in finding the right learning mode. (3) The blended learning strategy of guided inquiry learning settings is very good in giving effect to increase the acquisition of learning concepts and procedures of students on the material of the body's defense system in Biology subjects in high school.

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INTRODUCTION

The blended learning strategy is an innovation due to distrub that occurs in the world of education. Blended learning is a combination of traditional face-to-face learning and online which has a more flexible time (Su, 2019). This strategy emerged as a response to current technological advances. In line with these advances, encouraging construction to innovate in learning. Both related to the way teachers teach and how students learn can also influence it.

According to (Gillespie et al., 2007) information and communication technology has changed rapidly so that teachers are asked to develop new and innovative ideas from ICT for learning. One of these innovations is virtual learning. So in this situation, the teacher must be truly independent in determining the right way of teaching so that students can find a way of learning that is in accordance with the expected skills and abilities.

Education today requires knowledge, skills, and attitudes, as well as mastery of Information and Communication Technology (ICT). In addition, students are prepared to face global challenges so that higher order thinking skills (HOTS) are needed or in other words education must be able to prepare an educated generation that can compete in the world of work. The use of technology is part of a strategy in learning that can be developed through critical thinking skills and problem solving, communication, creativity, and collaboration. This means that building a virtual learning environment can stimulate higher order thinking skills (HOTS) in students. So what is needed is a combination of learning settings that integrate technology (Dewi, D. R., 2019; Yusuf, I., & Widyaningsih, S. W., 2022).

But in reality the use of technology in learning in the classroom or outside the classroom is often misused by students. Many students use technology not in essence. Students make information and communication technology in the form of smartphone use often used only for playing social media, games or watching movies. The solution to this problem is to utilize technology into learning settings that package interesting and fun learning models so that they can improve student learning outcomes. Because the completeness of student learning outcomes lies in the acquisition of learning that strengthens concepts and procedures. The acquisition of such learning is a stage in the learning process of students to achieve their learning goals. So that the teacher must be able to design a lesson that can affect the learning process of students. One of the learning models that can affect the learning process of students is the inquiry learning model.

The advantages of guided inquiry learning over other observational learning, which is an approach that is closely related to studying examples that are done (Spector et al., 2014). The use of guided inquiry models in the learning process can assist students in solving a problem, because through this model students can find information on their own through discovery so that the understanding of the material that students get will be more meaningful and easily absorbed by students. As explained by Duffy (2009) in (Alfieri et al., 2011), inquiry is a constructivism that emphasizes student motivation and tends to provide guidance or feedback. So that investigation provides a series of questions to be asked and answered (Botturi & Stubbs, 2008). An inquiry approach to teaching science can effectively help students develop critical reasoning capacities, including students' ability to ask scientific and investigative questions, to accurately record and interpret results, in order to relate their findings to growing scientific knowledge (Sutman et al., 2008). Therefore, guided inquiry plays an important role in mastery of learning that affects the learning process of students. This inquiry tends to affect the acquisition of learning concepts and procedures through HOTS skills, namely; Critical Thinking and Problem Solving Skills, Communication Skills, Creativity and Innovation, and Collaboration (Islami, D. F., & Fitri, R., 2021). So that utilizing a virtual learning environment (online) is very possible to develop mastery of higher order thinking skills (HOTS).

A robust open-source online learning environment can support guided inquiry, embedded assessment, peer collaboration, interactive computer models, and teacher customization (Spector et al., 2014). Science teaching can be successful if technology is used meaningfully and correctly to assist the development of students' inquiry abilities. Therefore (Practices, 2015), ICT is indispensable in today's science teaching from the perspective of representation of science content and scientific practice. Practices emphasizes that using ICT to assist in science content delivery and the development of students' inquiry skills is important, but knowing students and tracking their learning progress throughout science learning is necessary to make teaching and learning effective and efficient. So that learning that focuses on student inquiry and develops students' abilities and skills to learn and has an

emphasis on the use of diverse resources, provides great opportunities for e-learning (Practices, 2015).

In learning biology, the acquisition of learning concepts and procedures is very important. Because concept strengthening is a means to support the acquisition of learning procedures. Mastery of procedures in biology subjects is a concrete learning activity on biological concepts. The results of observations of biology subjects in high school show that biology learning activities have not been carried out and have achieved their goals optimally. Because students are not motivated to be active in learning activities. The impact of such learning problems is found in one of the subjects, namely the body's defense system. This material investigated is material that is difficult for students to learn because the subject matter is quite complicated. The difficulties experienced by students are due to the material being studied tends to be abstract.

This material requires a higher understanding than the previous material. Many new terms that must be understood by students. In addition, students tend to find it difficult to understand the formation of immunity in the body and the immune processes that occur in the body. This is evidenced by the learning outcomes of students, where not all students achieve the KKM (Minimum Completeness Criteria) so that students who do not pass must take remedial courses. In fact, such problems are converging on the acquisition of learning concepts and procedures.

Based on the description of the problem above, the solution to be applied is to create a virtual learning environment that combines technology into a guided inquiry learning setting. Such a combination is the application of the blended learning strategy of guided inquiry learning settings to the acquisition of learning concepts and procedures in biology subjects. The learning setting places blended learning into a strategy that plays a role in regulating the acquisition of learning concepts and procedures.

METHOD

Research Design

This study was designed using a pre-experimental one-group pre-post test design, in this design are: a) the measurement of dependent variables from one group of subjects (pretest), b) the subject is given treatment for a certain period of time (exposure), c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurement were compared with the posttest measurement results.

Population and Samples

This study involved students of class XI IPA 3 SMA Negeri 2 Gorontalo which is located on Jl. Rambutan, Buladu Village, Kota Barat Subdistrict, Gorontalo City, Gorontalo, totaling 35 people consisting of 22 women and 13 men.

Instrument

The instrument applied aims to measure the acquisition of learning concepts and procedures in the subject of biology in the body's defense system material. The instrument in question is the acquisition of learning outcomes in the form of an acquisition test of learning concepts and procedures consisting of the ability to understand and use concepts and procedures. The test developed to measure the learning achievement is a test in the form of a description or essay. The concept understanding test is to determine the understanding of biological concepts with indicators of knowledge of Bloom's Taxonomy revised by Anderson and Krathwohl, including ability; (1) remember (remember); (2) understand (understand); (3) apply (apply); (4) analyze (analyze); (5) evaluate (evaluate); and (6) create. Procedure text is a text that contains a method, a goal to make or do something step by step in an appropriate sequence so as to produce a desired goal. This text is classified into three types, namely text that contains how to use tools, objects, or the like, text that contains how to do an activity, and text that contains certain habits or characteristics. Procedure text aims to help students understand how to do or make something right (Table 1).

Table 1. Research Instrument

Concept Learning Acquisition Test	Procedure Text
1. Essay Test / Description The concept understanding test is to find out the understanding of biological concepts	1. The text contains how to use tools, objects, or the like 2. The text contains how to do an activity 3. text that contains certain habits or characteristics

Procedure

The research procedure carried out on the research subjects included giving a pretest, giving treatment and then doing a posttest after all meetings were carried out. The experimental procedure was arranged starting from the pre-experimental one-group pre-post test design as shown in the following figure.

The One-Group Pretest-Posttest Design

O	X	O
Pretest	Treatment	Posttest

Figure 1. One-Group Pretest-Posttest Research Model

Information:
O = Observation of pretest results
O = Observation of posttest results
X = learning strategy blended learning guided inquiry learning setting

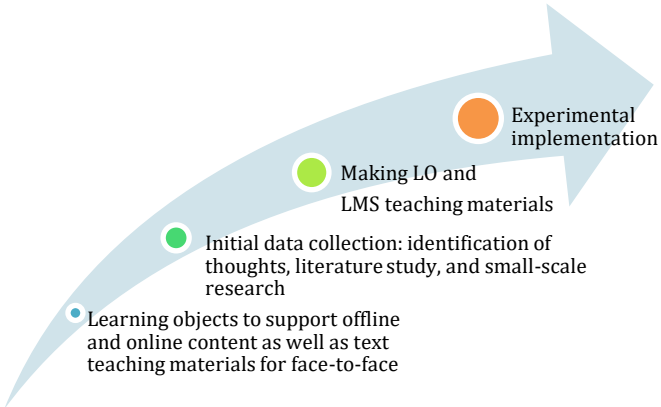

Figure 2. Stages of research procedures

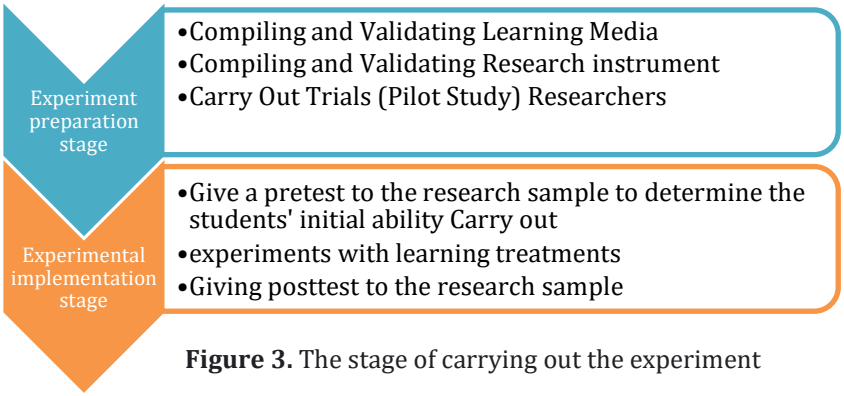

Figure 3. The stage of carrying out the experiment

Data Analysis Techniques

Testing the independent variables on the dependent variable in this study using the T-test through the SPSS application. The steps taken in the technique are;

j. Normality test

The data normality test is a test carried out to determine whether the distribution of the data to be analyzed is normal or not. The normality test used is Kolmogorov-Smirnov using SPSS. The hypotheses in this test are as follows:

H0 : Data is normally distributed

Ha : The data is not normally distributed

If the Kolmogorov-Smirnov significance is more than (sig>0.05), then Ho is accepted so that it can be stated that the data is normally distributed.

k. Homogeneity Test

The homogeneity test was conducted to determine whether the respondent groups taken had the same variance. Homogeneity test using Levene's with = 0.05 and assisted by the SPSS program. If the significance value of F is greater than (sig> 0.05), then Ho is accepted so that it can be stated that the group of respondents whose variance is homogeneous.

l. Hypothesis testing

Based on the formulation of the problem, what is meant by influence is a change from the initial condition and the final condition in this case the final condition is better than the initial condition. That is, the effect test is the same as testing whether the final condition is higher than the initial condition after the application of the blended learning learning strategy in guided inquiry learning settings, the posttest score is better than the pretest. The hypothesis test used aims to test the comparative hypothesis between two different variables, namely between the ability of students to acquire learning concepts and procedures before and after applying the blended learning strategy in guided inquiry learning settings. To find out this value, using a statistical test in the form of a paired t-test (Two Paired Samples Test) in the SPSS program. The hypothesis used is as follows:

H0: There is no effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning concepts and the acquisition of learning procedures.

Ha : There is an effect of the blended learning strategy of guided inquiry learning setting on the acquisition of learning concepts and the acquisition of learning procedures.

RESULT AND DISCUSSION

The results of statistical tests that simultaneously test whether there is an effect on the acquisition of learning concepts and the acquisition of learning procedures on the material of the body's defense system by applying the blended learning strategy of guided inquiry learning settings produce statistical tests with probability values or Sig. the values of the body's defense system are Sig. 0.000 which turns out to be much smaller than the criteria for determining the level of significance ($\alpha = 0.05$), in connection with which it is stated that there is an influence between learning strategies and the acquisition of learning concepts and the acquisition of learning procedures for system materials. body defense. The conclusion of the test results indicate that the independent variable learning strategy has a strong effect on the two dependent variables simultaneously.

g. Concept Learning Acquisition

Based on the results of the first hypothesis test, the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of concept learning resulted in

the average value of concept learning acquisition before and after applying the guided inquiry learning setting blended learning strategy, more details as shown in the following table 2.

Table 2. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	55,97	36	10,199	1,700
	Post Test	74,83	36	14,236	2,373

The output above is a summary of the descriptive statistical results of the two samples measured, namely the pretest score of 55.97 and posttest 74.83 of the 36 students respondents. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average learning outcomes of concepts. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 3).

Table 3. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,173	,312

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.173 with a significant value of 0.312 > 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of concept learning (Table 4)

Table 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-18,861	16,011	2,668	-24,278	-13,444	-7,068	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of the acquisition of concept learning at the pretest and the posttest, which means that there is an influence of the blended learning strategy of guided inquiry learning settings on the acquisition of students' concept learning in the body's defense system material.

h. Procedure Learning Acquisition

Based on the results of the second hypothesis test regarding the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning procedures, the average value of the acquisition of learning procedures before and after applying the blended learning strategy of guided inquiry learning settings is shown, in more detail as shown in the following table 5.

Table 5. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	56,92	36	8,044	1,341
	Post Test	81,19	36	9,704	1,617

The output above explains the summary of the descriptive statistical results of the two samples measured, namely the pretest score for learning procedures is 56.92 and the posttest is 81.19 for 36 students. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average results of learning procedures. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 6).

Table 6. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,296	,079

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.296 with a significant value of 0.079> 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of learning procedures below (Table 7).

Table 7. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-24,278	10,612	1,769	-27,868	-20,687	-13,727	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of learning procedural gains in the pretest and posttest, which means that there is an influence of the blended learning strategy learning setting guided inquiry learning on the acquisition of students' learning procedures on the material of the body's defense system. Based on the results of data analysis and the results of hypothesis testing, it is known that there are differences in the acquisition of learning concepts and procedures of students, in the body defense system material taught before and after using the blended learning strategy in guided inquiry learning settings. By calculating the descriptive test, the acquisition of learning concepts and procedures of students who are taught using the blended learning strategy of guided inquiry learning settings obtain an average score of the acquisition of learning concepts and procedures is higher when compared to the average acquisition of learning concepts and procedures before using the strategy blended learning learning setting guided inquiry learning. This means that the application of blended learning learning strategies in guided inquiry learning settings has a better influence on the acquisition of learning concepts and procedures of students on the material of the body's defense system. These findings prove that the classroom by implementing a blend of learning strategies through the best elements (blended learning) has effectiveness when compared to stand-alone learning strategies, either face-to-face or online (Graham, 2004; Halverson et al., 2017; Hrastinski, 2019).

CONCLUSION

Based on the analysis of the research data, it can be concluded that 1) There is a difference in the acquisition of learning the concept of the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of blended learning learning strategies in guided inquiry learning settings is significantly better in increasing the acquisition of learning concepts than before the implementation of the learning strategy; 2) There is a difference in the acquisition of learning procedures for the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of the blended learning learning strategy in guided inquiry learning settings was significantly better in increasing the acquisition of learning procedures than before the implementation of the learning strategy.

Based on the conclusions above, one general conclusion can be drawn that the blended learning strategy of guided inquiry learning settings is very good in giving an effect on increasing the acquisition of learning concepts and procedures of students in the body defense system material for Biology subjects in high school.

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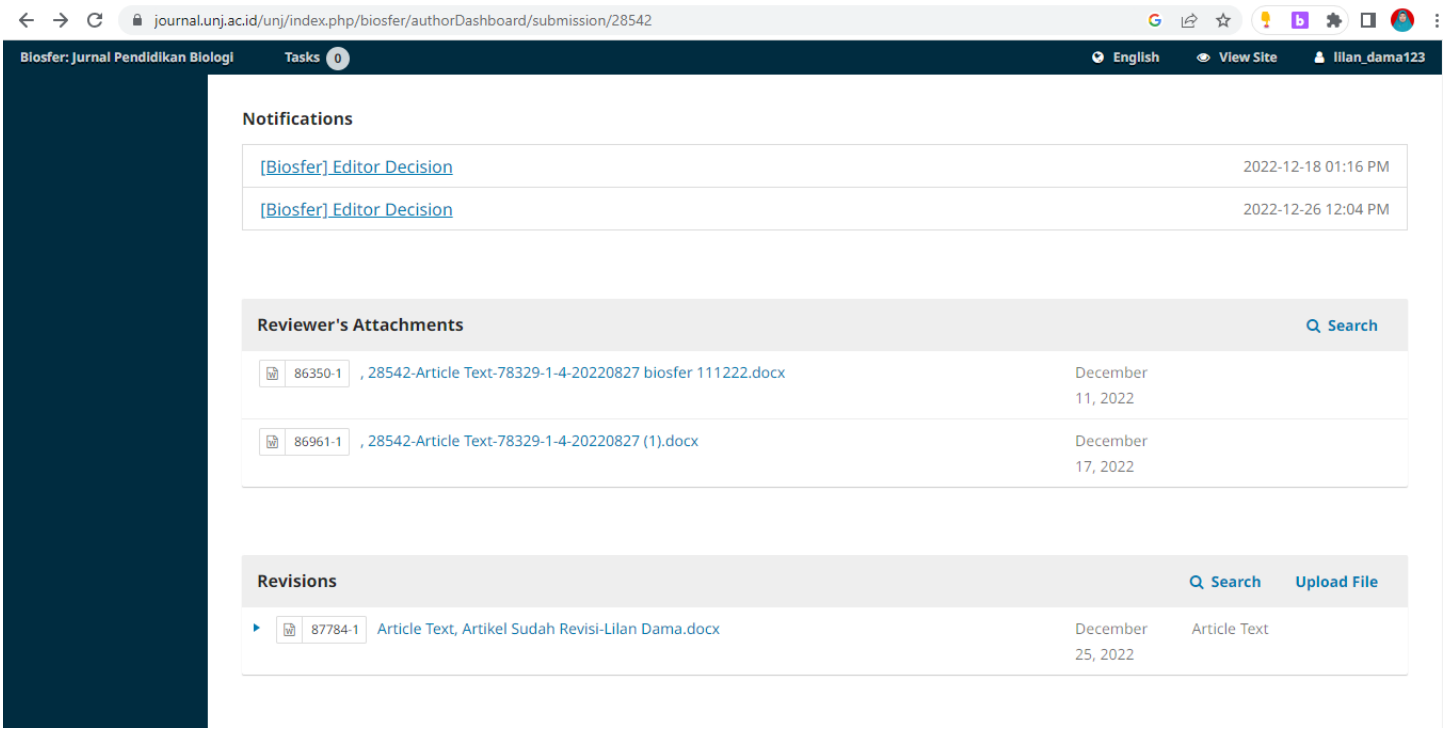
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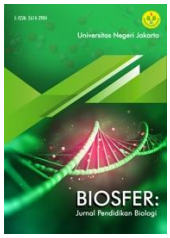

Blended Learning Strategies Through Guided Inquiry Learning Settings To Increase Learning Acquisition Of Concepts And Procedures In Biology Subjects

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ABSTRACT

The application of blended learning strategies through guided inquiry learning arrangements aims to increase the acquisition of students' learning concepts and procedures on the material of the body's defense system. The purpose of this study was to examine the effect of blended learning strategies with guided inquiry learning settings on the acquisition of learning concepts and procedures in biology subjects in high school. This test was carried out using a pre-experimental one-group pre-post test design, in this design: a) measurement of dependent variables from one group of subjects (pretest), b) subjects were given treatment for a certain period of time (exposure). , c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurements were compared with the results of the posttest measurements. This study involved 36 students of second grade of Science class 3 of Public Senior High School 3 Gorontalo, consisting of 22 women and 14 men. The results of this study have an impact on several aspects, namely; (1) Provide scientific experience so that it can become the best practice for fostering student teacher candidates. (2) Contribute directly to schools through teacher partnerships in finding the right learning mode. (3) The blended learning strategy of guided inquiry learning settings is very good in giving effect to increase the acquisition of learning concepts and procedures of students on the material of the body's defense system in Biology subjects in high school.

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The blended learning strategy is an innovation due to distrub that occurs in the world of education. Blended learning is a combination of traditional face-to-face learning and online which has a more flexible time (Su, 2019). This strategy emerged as a response to current technological advances. In line with these advances, encouraging construction to innovate in learning. Both related to the way teachers teach and how students learn can also influence it. According to (Gillespie et al., 2007) information and communication technology has changed rapidly so that teachers are asked to develop new and innovative ideas from ICT for learning. One of these innovations is virtual learning. So in this situation, the teacher must be truly

independent in determining the right way of teaching so that students can find a way of learning that is in accordance with the expected skills and abilities.

Education today requires knowledge, skills, and attitudes, as well as mastery of Information and Communication Technology (ICT). In addition, students are prepared to face global challenges so that higher order thinking skills (HOTS) are needed or in other words education must be able to prepare an educated generation that can compete in the world of work. The use of technology is part of a strategy in learning that can be developed through critical thinking skills and problem solving, communication, creativity, and collaboration. This means that building a virtual learning environment can stimulate higher order thinking skills (HOTS) in students. So what is needed is a combination of learning settings that integrate technology (Dewi, D. R., 2019; Yusuf, I., & Widyaningsih, S. W., 2022).

But in reality the use of technology in learning in the classroom or outside the classroom is often misused by students. Many students use technology not in essence. Students make information and communication technology in the form of smartphone use often used only for playing social media, games or watching movies. The solution to this problem is to utilize technology into learning settings that package interesting and fun learning models so that they can improve student learning outcomes. Because the completeness of student learning outcomes lies in the acquisition of learning that strengthens concepts and procedures. The acquisition of such learning is a stage in the learning process of students to achieve their learning goals. So that the teacher must be able to design a lesson that can affect the learning process of students. One of the learning models that can affect the learning process of students is the inquiry learning model.

The advantages of guided inquiry learning over other observational learning, which is an approach that is closely related to studying examples that are done (Spector et al., 2014). The use of guided inquiry models in the learning process can assist students in solving a problem, because through this model students can find information on their own through discovery so that the understanding of the material that students get will be more meaningful and easily absorbed by students. As explained by Duffy (2009) in (Alfieri et al., 2011), inquiry is a constructivism that emphasizes student motivation and tends to provide guidance or feedback. So that investigation provides a series of questions to be asked and answered (Botturi & Stubbs, 2008). An inquiry approach to teaching science can effectively help students develop critical reasoning capacities, including students' ability to ask scientific and investigative questions, to accurately record and interpret results, in order to relate their findings to growing scientific knowledge (Sutman et al., 2008). Therefore, guided inquiry plays an important role in mastery of learning that affects the learning process of students. This inquiry tends to affect the acquisition of learning concepts and procedures through HOTS skills, namely; Critical Thinking and Problem Solving Skills, Communication Skills, Creativity and Innovation, and Collaboration (Islami, D. F., & Fitri, R., 2021). So that utilizing a virtual learning environment (online) is very possible to develop mastery of higher order thinking skills (HOTS).

A robust open-source online learning environment can support guided inquiry, embedded assessment, peer collaboration, interactive computer models, and teacher customization (Spector et al., 2014). Science teaching can be successful if technology is used meaningfully and correctly to assist the development of students' inquiry abilities. Therefore (Practices, 2015), ICT is indispensable in today's science teaching from the perspective of representation of science content and scientific practice. Practices emphasizes that using ICT to assist in science content delivery and the development of students' inquiry skills is important, but knowing students and tracking their learning progress throughout science learning is necessary to make teaching and learning effective and efficient. So that learning that focuses on student inquiry and develops students' abilities and skills to learn and has an emphasis on the use of diverse resources, provides great opportunities for e-learning (Practices, 2015).

In learning biology, the acquisition of learning concepts and procedures is very important. Because concept strengthening is a means to support the acquisition of learning

procedures. Mastery of procedures in biology subjects is a concrete learning activity on biological concepts. The results of observations of biology subjects in high school show that biology learning activities have not been carried out and have achieved their goals optimally. Because students are not motivated to be active in learning activities. The impact of such learning problems is found in one of the subjects, namely the body's defense system. This material investigated is material that is difficult for students to learn because the subject matter is quite complicated. The difficulties experienced by students are due to the material being studied tends to be abstract.

This material requires a higher understanding than the previous material. Many new terms that must be understood by students. In addition, students tend to find it difficult to understand the formation of immunity in the body and the immune processes that occur in the body. This is evidenced by the learning outcomes of students, where not all students achieve the KKM (Minimum Completeness Criteria) so that students who do not pass must take remedial courses. In fact, such problems are converging on the acquisition of learning concepts and procedures.

Based on the description of the problem above, the solution to be applied is to create a virtual learning environment that combines technology into a guided inquiry learning setting. Such a combination is the application of the blended learning strategy of guided inquiry learning settings to the acquisition of learning concepts and procedures in biology subjects. The learning setting places blended learning into a strategy that plays a role in regulating the acquisition of learning concepts and procedures.

METHOD

Research Design

This study was designed using a pre-experimental one-group pre-post test design, in this design are: a) the measurement of dependent variables from one group of subjects (pretest), b) the subject is given treatment for a certain period of time (exposure), c) the second measurement (posttest) was carried out on the independent variables, and d) the results of the pretest measurement were compared with the posttest measurement results.

Population and Samples

This study involved students of class XI IPA 3 SMA Negeri 2 Gorontalo which is located on Jl. Rambutan, Buladu Village, Kota Barat Subdistrict, Gorontalo City, Gorontalo, totaling 35 people consisting of 22 women and 13 men.

Instrument

The instrument applied aims to measure the acquisition of learning concepts and procedures in the subject of biology in the body's defense system material. The instrument in question is the acquisition of learning outcomes in the form of an acquisition test of learning concepts and procedures consisting of the ability to understand and use concepts and procedures. The test developed to measure the learning achievement is a test in the form of a description or essay. The concept understanding test is to determine the understanding of biological concepts with indicators of knowledge of Bloom's Taxonomy revised by Anderson and Krathwohl, including ability; (1) remember (remember); (2) understand (understand); (3) apply (apply); (4) analyze (analyze); (5) evaluate (evaluate); and (6) create. Procedure text is a text that contains a method, a goal to make or do something step by step in an appropriate sequence so as to produce a desired goal. This text is classified into three types, namely text that contains how to use tools, objects, or the like, text that contains how to do an activity, and text that contains certain habits or characteristics. Procedure text aims to help students understand how to do or make something right (Table 1).

Table 1. Research Instrument

Concept Learning Acquisition Test	Procedure Text
1. Essay Test / Description The concept understanding test is to find out the understanding of biological concepts	1. The text contains how to use tools, objects, or the like 2. The text contains how to do an activity 3. text that contains certain habits or characteristics

Procedure

The research procedure carried out on the research subjects included giving a pretest, giving treatment and then doing a posttest after all meetings were carried out. The experimental procedure was arranged starting from the pre-experimental one-group pre-post test design as shown in the following figure.

The One-Group Pretest-Posttest Design

O	X	O
Pretest	Treatment	Posttest

Figure 1. One-Group Pretest-Posttest Research Model

Information:
O = Observation of pretest results
O = Observation of posttest results
X = learning strategy blended learning guided inquiry learning setting

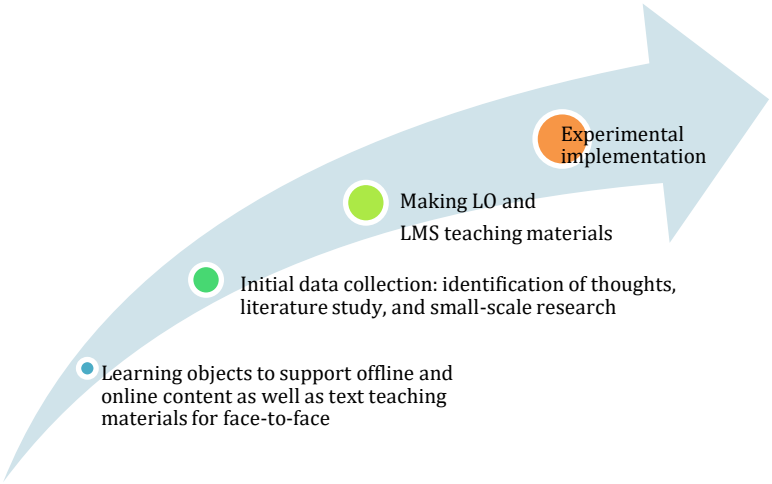

Figure 2. Stages of research procedures

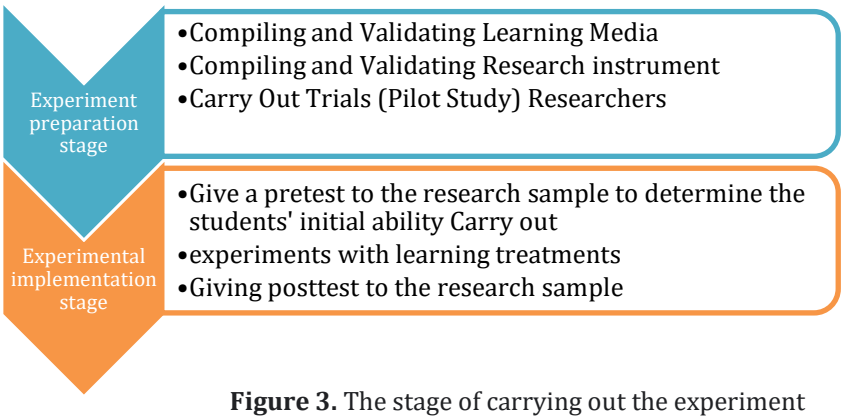

Figure 3. The stage of carrying out the experiment

Data Analysis Techniques

Testing the independent variables on the dependent variable in this study using the T-test through the SPSS application. The steps taken in the technique are;

m. Normality test

The data normality test is a test carried out to determine whether the distribution of the data to be analyzed is normal or not. The normality test used is Kolmogorov-Smirnov using SPSS. The hypotheses in this test are as follows:

H0 : Data is normally distributed

Ha : The data is not normally distributed

If the Kolmogorov-Smirnov significance is more than (sig>0.05), then Ho is accepted so that it can be stated that the data is normally distributed.

n. Homogeneity Test

The homogeneity test was conducted to determine whether the respondent groups taken had the same variance. Homogeneity test using Levene's with = 0.05 and assisted by the SPSS program. If the significance value of F is greater than (sig> 0.05), then Ho is accepted so that it can be stated that the group of respondents whose variance is homogeneous.

o. Hypothesis testing

Based on the formulation of the problem, what is meant by influence is a change from the initial condition and the final condition in this case the final condition is better than the initial condition. That is, the effect test is the same as testing whether the final condition is higher than the initial condition after the application of the blended learning learning strategy in guided inquiry learning settings, the posttest score is better than the pretest. The hypothesis test used aims to test the comparative hypothesis between two different variables, namely between the ability of students to acquire learning concepts and procedures before and after applying the blended learning strategy in guided inquiry learning settings. To find out this value, using a statistical test in the form of a paired t-test (Two Paired Samples Test) in the SPSS program. The hypothesis used is as follows:

H0: There is no effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning concepts and the acquisition of learning procedures.

Ha : There is an effect of the blended learning strategy of guided inquiry learning setting on the acquisition of learning concepts and the acquisition of learning procedures.

RESULT AND DISCUSSION

The results of statistical tests that simultaneously test whether there is an effect on the acquisition of learning concepts and the acquisition of learning procedures on the material of the body's defense system by applying the blended learning strategy of guided inquiry learning settings produce statistical tests with probability values or Sig. the values of the body's defense system are Sig. 0.000 which turns out to be much smaller than the criteria for determining the level of significance (α = 0.05), in connection with which it is stated that there is an influence between learning strategies and the acquisition of learning concepts and the acquisition of learning procedures for system materials. body defense. The conclusion of the test results indicate that the independent variable learning strategy has a strong effect on the two dependent variables simultaneously.

i. Concept Learning Acquisition

Based on the results of the first hypothesis test, the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of concept learning resulted in the average value of concept learning acquisition before and after applying the guided inquiry learning setting blended learning strategy, more details as shown in the following table 2.

Table 2. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	55,97	36	10,199	1,700
	Post Test	74,83	36	14,236	2,373

The output above is a summary of the descriptive statistical results of the two samples measured, namely the pretest score of 55.97 and posttest 74.83 of the 36 students respondents. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average learning outcomes of concepts. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 3).

Table 3. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,173	,312

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.173 with a significant value of 0.312 > 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of concept learning (Table 4)

Table 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-18,861	16,011	2,668	-24,278	-13,444	-7,068	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of the acquisition of concept learning at the pretest and the posttest, which means that there is an influence of the blended learning strategy of guided inquiry learning settings on the acquisition of students' concept learning in the body's defense system material.

j. Procedure Learning Acquisition

Based on the results of the second hypothesis test regarding the effect of the blended learning strategy of guided inquiry learning settings on the acquisition of learning procedures, the average value of the acquisition of learning procedures before and after applying the blended learning strategy of guided inquiry learning settings is shown, in more detail as shown in the following table 5.

Table 5. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	56,92	36	8,044	1,341
	Post Test	81,19	36	9,704	1,617

The output above explains the summary of the descriptive statistical results of the two samples measured, namely the pretest score for learning procedures is 56.92 and the posttest is 81.19 for 36 students. Because the average value of learning outcomes in the pretest < posttest, descriptively there is a difference in the average results of learning procedures. Furthermore, to prove the difference is really real (significant), it is necessary to interpret the results of the paired sample t-test below (Table 6).

Table 6. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	36	,296	,079

The output above explains the results of the correlation test or the relationship between the two pretest and posttest variables. Where it is known that the correlation coefficient is 0.296 with a significant value of 0.079> 0.05 probability. So it can be stated that there is no relationship between the pretest and posttest variables for the acquisition of learning procedures below (Table 7).

Table 7. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre Test - Post Test	-24,278	10,612	1,769	-27,868	-20,687	-13,727	35	,000

Based on the output above, it is known that the value of Sig. (2-tailed) is 0.000 < 0.05, this means that the hypothesis H¬0 is rejected and Ha is accepted. Therefore, it can be concluded that there is an average difference between the results of learning procedural gains in the pretest and posttest, which means that there is an influence of the blended learning strategy learning setting guided inquiry learning on the acquisition of students' learning

procedures on the material of the body's defense system. Based on the results of data analysis and the results of hypothesis testing, it is known that there are differences in the acquisition of learning concepts and procedures of students, in the body defense system material taught before and after using the blended learning strategy in guided inquiry learning settings. By calculating the descriptive test, the acquisition of learning concepts and procedures of students who are taught using the blended learning strategy of guided inquiry learning settings obtain an average score of the acquisition of learning concepts and procedures is higher when compared to the average acquisition of learning concepts and procedures before using the strategy blended learning learning setting guided inquiry learning. This means that the application of blended learning learning strategies in guided inquiry learning settings has a better influence on the acquisition of learning concepts and procedures of students on the material of the body's defense system. These findings prove that the classroom by implementing a blend of learning strategies through the best elements (blended learning) has effectiveness when compared to stand-alone learning strategies, either face-to-face or online (Graham, 2004; Halverson et al., 2017; Hrastinski, 2019).

CONCLUSION

Based on the analysis of the research data, it can be concluded that 1) There is a difference in the acquisition of learning the concept of the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of blended learning learning strategies in guided inquiry learning settings is significantly better in increasing the acquisition of learning concepts than before the implementation of the learning strategy; 2) There is a difference in the acquisition of learning procedures for the body's defense system between before and after using the blended learning learning strategy in guided inquiry learning settings. The use of the blended learning learning strategy in guided inquiry learning settings was significantly better in increasing the acquisition of learning procedures than before the implementation of the learning strategy.

Based on the conclusions above, one general conclusion can be drawn that the blended learning strategy of guided inquiry learning settings is very good in giving an effect on increasing the acquisition of learning concepts and procedures of students in the body defense system material for Biology subjects in high school.

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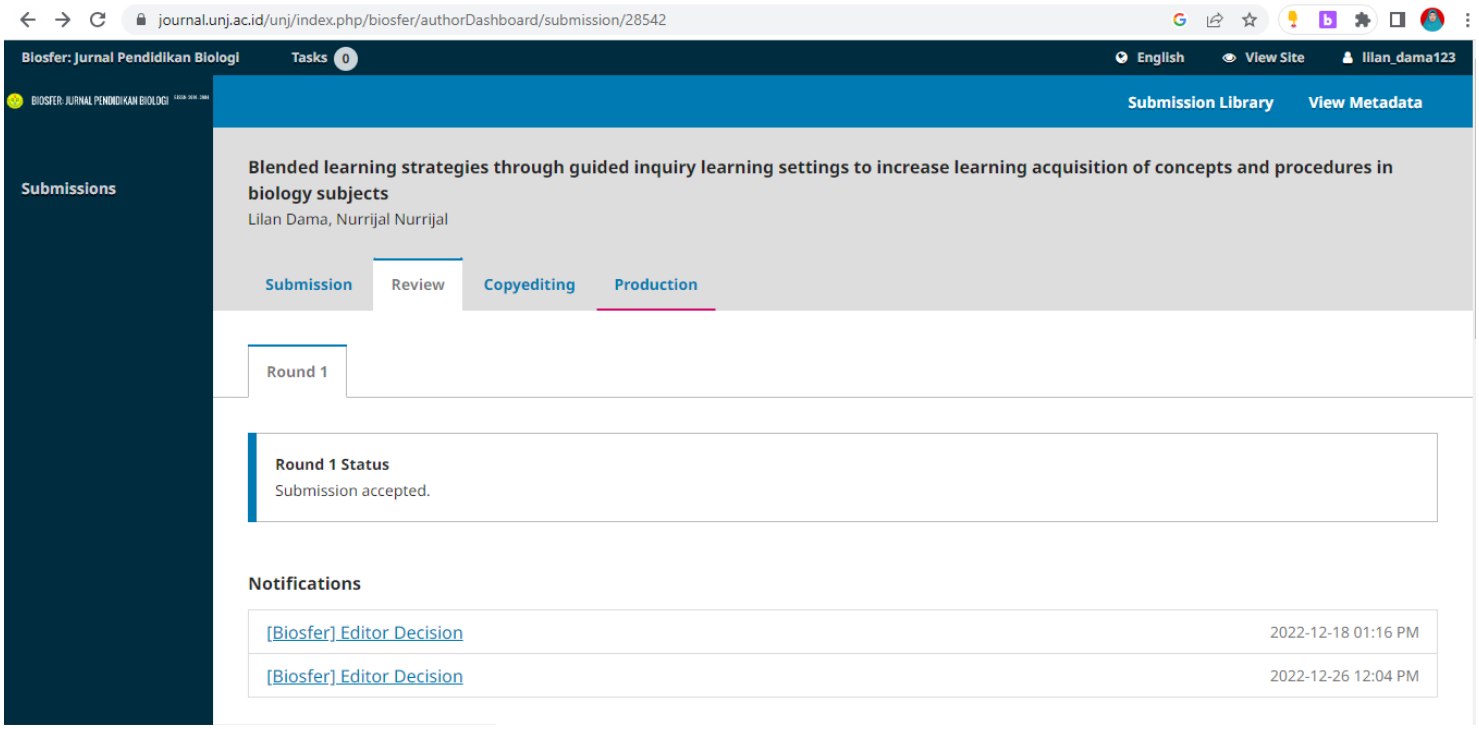
6. Bukti Konfirmasi Artikel Accepted (26 Des 2022)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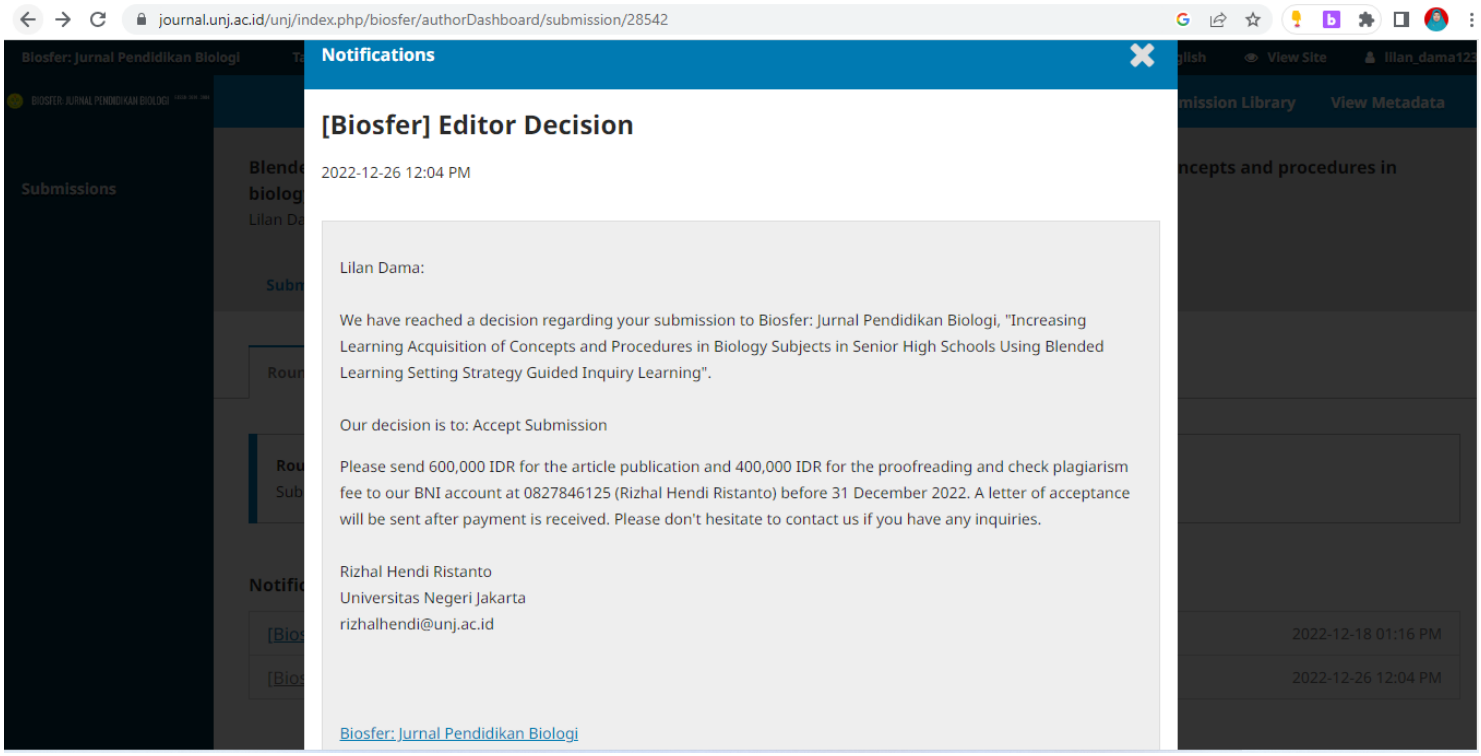
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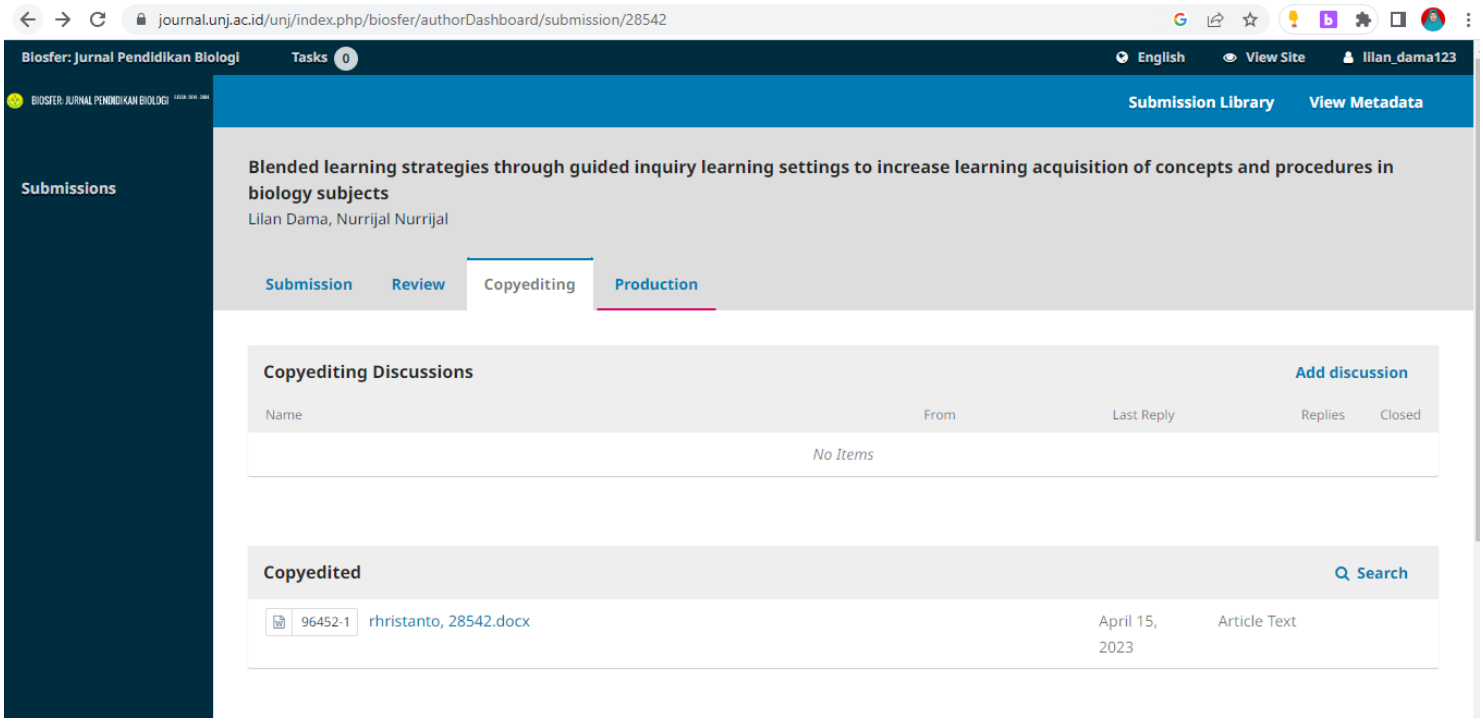
7. Bukti Konfirmasi Artikel Published Online (15 April 2023)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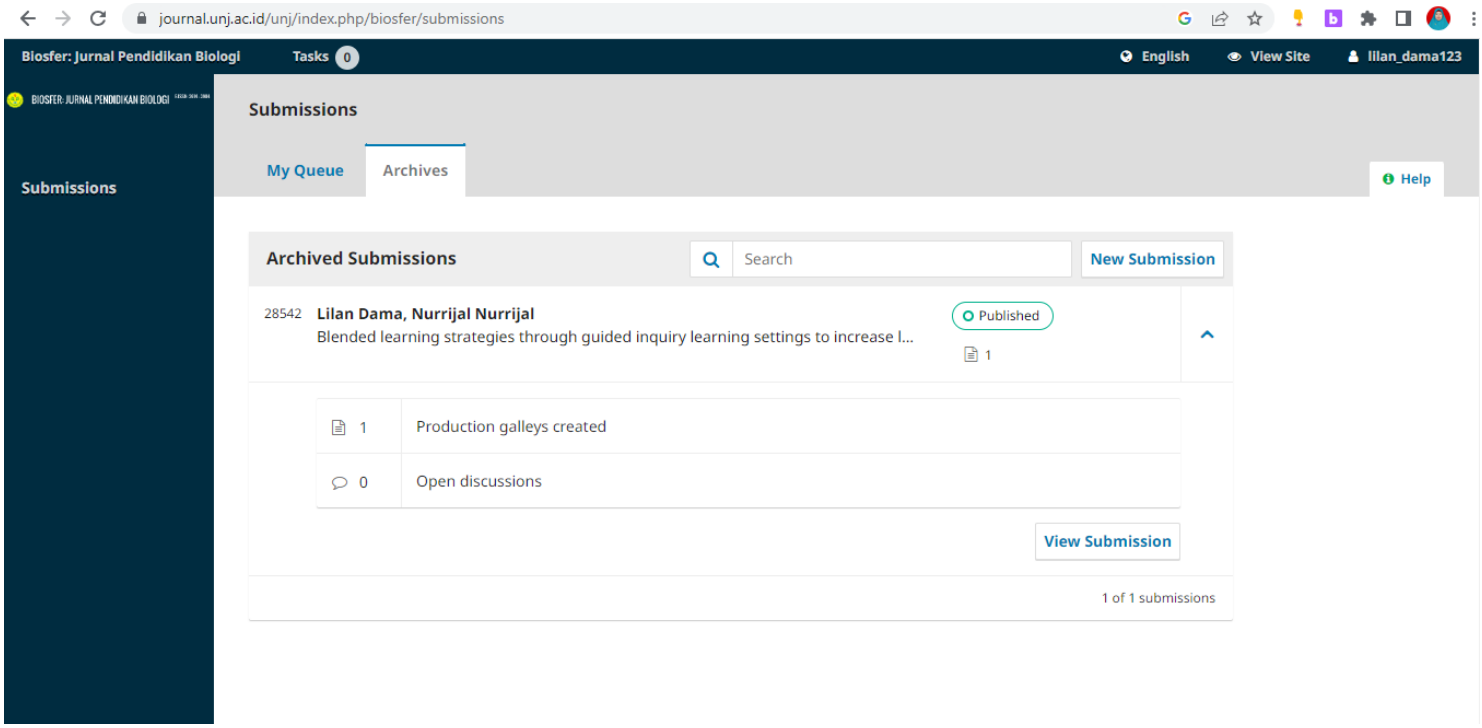
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Blended learning strategies through guided inquiry learning settings to increase learning acquisition of concepts and procedures in biology subjects

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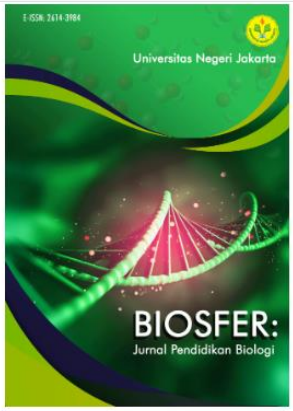
Keywords: Acquisition of learning concepts, and procedures, Blended learning strategy, Guided inquiry

Abstract

The application of blended learning strategies through guided inquiry learning arrangements aims to increase the acquisition of students' learning concepts and procedures on the material of the body's defense system. The purpose of this study was to examine the effect of blended learning strategies with guided inquiry learning settings on the acquisition of learning concepts and procedures in biology subjects in high school. This test was carried out using a pre-experimental one group pre-test and post-test design, in this design:a) measurement of dependent variables from one group of subjects (pretest), b) subjects were given treatment for a certain period of time (exposure). , c) the second measurement (posttest) was carried out on the independent variables, and d) comparison of the results



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