

## Correlation Between Learning Outcomes and Students' Science Process Skills in Class X Biology Material at SMA Negeri 9 North Luwu

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### Abstract

*This research aims to determine the relationship between learning outcomes and students' science process skills in class X biology material at SMA Negeri 9 North Luwu. This type of research is descriptive correlational research. The population in this study were all class X students at SMA Negeri 9 North Luwu, with a research sample of 73 students. The data collection technique uses a scientific process skills observation sheet consisting of 10 aspects: observing, grouping, interpreting, predicting, asking questions, formulating hypotheses, planning experiments, using tools and materials, applying concepts, and communicating and testing learning outcomes. The data analysis used in this research is correlation analysis. The results of the research show that the learning outcomes of class Based on the research results, it was concluded that there is a strong and positive correlation between science process skills and student learning outcomes in environmental change material for class X SMA Negeri 9 North Luwu.*

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## Introduction

Education plays a very important role in developing science, technology and human resources in a country. Today's demands and challenges impact learning patterns in Indonesia, which continue to develop (Yuliatin et al., 2021). In the current era of globalization, science and technology bring changes to life, including the world of education. Educational progress is a factor in the success of a nation (Sutrisna, 2021). Education aims to advance and educate the nation's life and develop the Indonesian human being. The learning process in the 2013 curriculum uses a scientific approach. Apart from that, the learning process is designed to be student-centered so that students can have motivation, interest in creativity, initiative, inspiration, independence, and enthusiasm for learning and use a scientific approach that can develop students' abilities (Pramundiyanti & Munazir, 2021).

The problems faced by Indonesian education are very diverse. One of the problems in Indonesian education is the lack of skills that can develop students' abilities to face global challenges (Aras et al., 2021). The ideal learning goal is to guide students to adapt to the real world, be able to think critically and creatively, solve problems, make decisions, and have goals and commitment in the learning process (Astuti et al., 2019).

Science process skills are not only applied in the learning process but also provide a solution to problems in everyday life (Wahyudi & Lestari, 2019). Discovering concepts in science involves basic skills through scientific experiments such as practicums, which can provide students with direct experience (Darmayanti et al., 2021). Through practical activities, students are expected to have the ability to think and act based on the knowledge they have. For this reason, science process skills in learning activities are very important for students' success in the learning process (Sari et al., 2019).

Based on the results of observations made at SMA Negeri 9 North Luwu, the implementation of biology learning is still teacher-centered. The teacher explains more when delivering the material, accompanied by questions and answers and giving assignments. Implementation of practicum activities is still rarely carried out because there are several obstacles faced, such as the availability of laboratory space which is currently used as a computer room, but teachers still try to carry out practicums even though they are carried out in the classroom. The practical activities are effectively used to train science process skills and improve students' understanding of the material, where students have their own learning experiences (Maulidyah et al., 2015).

Several researchers have proven that science process skills in science learning are very necessary, especially in biology learning, such as the research results of Sudarisman (2015) which states that science process skills especially in biology learning are necessary, especially in preparing future students who are critical, creative, competitive, able to solve problems and be brave in making decisions to survive productively in the face of global digital era competition, which is full of challenges. Apart from that, learning natural sciences is synonymous with scientific activities, which generate scientific attitudes (Dewi et al., 2019). Learning with a process of self-discovery through scientific methods supports the emergence of students' science process skills. Students are not only involved physically but can also develop their thinking abilities (Fatikasari et al., 2020). Science process skills can encourage students to think and act systematically through scientific processes and can influence students' character (Senarak, 2021).

Lack of skills that can develop students' abilities to deal with problems in everyday life (Damopolii et al., 2018). Science process skills are one solution that can be applied in learning activities. It is not only applied in the learning process but also becomes a provision in finding solutions to everyday problems to improve student learning outcomes (Budiarti & Jabar, 2016). Based on the description above, the researcher will conduct a study entitled "Correlation Between Learning Outcomes and Students' Science Process Skills in Class X Biology Material at SMA Negeri 9 North Luwu".

## Methods

This research, a descriptive quantitative correlational study with a survey method, is of significant importance to science education. It aims to establish the relationship between science process skills and student learning outcomes in the context of environmental change material at SMA Negeri 9 North Luwu. The study is correlational, with one independent variable (science process skills) and one dependent variable (student learning outcomes). The population under study is all students in class X Science at SMA Negeri 9 North Luwu, with a sample size of 73 students selected using a random sampling technique.

Observation sheets are used to measure science process skills. This observation sheet analyzes students' science process skills during learning activities. The observation sheet is equipped with aspects of science process skills, indicators of science process skills, and observation scores. Test instruments are used to measure the level of student learning outcomes. The learning outcomes test questions used are in the form of objective tests with environmental change material; for each question, there are five alternative answers, but only one answer is correct. Data collection techniques were carried out using observation sheets and learning outcomes tests. For data on science process skills in this research, direct observation was carried out on students during learning activities using observation guidelines containing aspects of science process skills, including observing, grouping, interpreting, predicting, asking questions, formulating hypotheses, and planning experiments using tools and materials, applying concepts, and communicating. Data on learning outcomes are collected and retrieved by distributing test questions. Each question item answered correctly will be given a score of 1, while students who answer incorrectly or do not answer the question will be given a score of 0.

The statistical analysis used to conclude the two variables, the prerequisite tests used are the normality, linearity, and hypothesis tests. The normality test is used to determine whether the sample is normally distributed or not. The normality method in this study was carried out using Kolmogorov-Smirnov on the SPSS version 26 for Windows computer program. The criteria for determining this are by comparing the Sig value. (2-tailed) in the Kolmogorov-Smirnov table with a significance level 0.05 (5%). Thus, the basis for decision-making is that the p of the KS coefficient is  $> 0.05$ , so the data is normally distributed. Conversely, if p of the KS coefficient  $< 0.05$ , the distribution is not normal. The linearity test determines whether the existing variables have a linear relationship. Research using SPSS v. 26 to make testing easier. The linearity test can be determined by looking at the sig probability value on the deviation from linearity at the 5% significance level. If the significance value (sig)  $< 0.05$ , there is no linear relationship. If the significance value (sig)  $> 0.05$ , there is a linear relationship. The correlation test used is the Product Moment correlation test to determine whether or not there is a relationship between variables, namely science process skills and student learning outcomes.

## Results and Discussion

The results of the analysis carried out using the science process skills normality test showed that the data was normally distributed. Based on the results of the normality test of the science process skills observation sheet using SPSS v.26, it is known that the significance value is  $0.420 > 0.05$ , so it can be concluded that the data sample is distributed (normal). The following table shows the results of the normality test analysis.

**Table 1. Normality Test Results for Science Process Skills**

	Tests of Normality					
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	Df	Sig.	Statistics	Df	Sig.
Science Process Skills	,099	73	,075	,983	73	,420

The results of the analysis carried out using the normality test of learning outcomes show that based on the results of the normality test of the learning outcomes test using SPSS v.26, it is known that the significance value is  $0.085 > 0.05$ , it can be concluded that the data sample is distributed (normal).

**Table 2. Normality Test Results of Student Learning Outcomes**

	Tests of Normality					
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	Df	Sig.	Statistics	Df	Sig.
Learning outcomes	,112	73	,024	,971	73	,085

Based on the results of the linearity test of science process skills with learning outcomes on environmental change material for class.

**Table 3. Results of Linearity Test of Science Process Skills with Learning Outcomes**

			ANOVA TABLE				
			Sum of Squares	df	Mean Square	F	Sig.
<b>Results Study* Skills Process Science</b>	Between	(Combined)	1860,381	8	232,546	15,929	,000
	Groups	Linearity	1688,716	1	1688,716	115,671	,000
		Deviation from Linearity	171,665	7	24,524	1,680	,130
	Within Groups		934,359	64	14,599		
	Total		2794,740	72			

The results of correlation test data analysis using the Product Moment correlation test from Karl Perason showed that the relationship between science process skills and learning outcomes in class X environmental change material was  $0.777^{**}$ , which means that the relationship between science process skills and learning outcomes in class X Environmental Change material North Luwu 9 Public High School is in the (strong correlation) category.

**Table 4. Correlation Test Results of Science Process Skills with Learning Outcomes**

		Correlation	
Process Skills Science	Pearson Correlation Sig. (2-tailed) N	Science Process Skills	Learning outcomes
		1	,777**
		73	73
Learning outcomes	Pearson Correlation Sig. (2-tailed) N	,777**	1
		,000	
		73	73

**\*\*.** Correlation is significant at the 0.01 level (2-tailed)

Based on the correlation test results, the relationship between science process skills and learning outcomes obtained a significance value of 0.000. If the significance value is  $<0.05$ , there is a correlation or relationship between the two variables. Thus, the hypothesis "There is a relationship between science

process skills and student learning outcomes in Environmental Change material for class X SMA Negeri 9 North Luwu" is accepted. The research results show that the Person correlation coefficient is 0.777(\*\*). This means the correlation between science process skills and learning outcomes is 0.777. Two stars (\*\*) means that the correlation is significant at a significance value of 0.05. The correlation coefficient figure is positive, so there is a positive relationship between science process skills and student learning outcomes.

Based on this relationship, increasing students' science process skills will be followed by increasing student learning outcomes. This means that if science process skills are good, then learning outcomes will also be good. Conversely, if science process skills are lacking, then learning outcomes will also be low. This is because students with good science process skills will be more active in learning activities and get better results. This study's results align with the research by Ningsih & Fatonah (2021) that states that science process skills and learning outcomes have a positive relationship or correlation with high interpretation, so learning outcomes will increase. Khairi's (2020) research results show that science process skills and learning outcomes positively correlate with high interpretation. Science process skills positively relate to concept mastery so that learning outcomes will increase. The higher the students' process skills, the better the impact on students' learning outcomes (Yunita & Nurita, 2021).

Science process skills can influence students' learning outcomes through planning, observing, connecting, interpreting, predicting, proposing experiments, formulating hypotheses, planning experiments, using tools and materials, applying concepts, and communicating (Candra & Hidayati, 2020). These skills are further divided into more specific ones, namely the skills of preparing experimental tools and materials, re-checking the readiness of tools and materials, proposing hypotheses, carrying out a series of experiments properly and correctly, identifying phenomena that appear in objects, identifying similarities or differences in objects, and read measuring instruments correctly. The assumption is that if most or even all of the skills that are part of the science process skills are carried out by students, they will easily understand, understand, and remember what they are learning or have learned (Saputra, 2020).

The active involvement of students in learning will improve their science process skills. Damopolii (2018), in his research, found that students' effective achievement of learning outcomes and science process skills increased due to the use of inquiry-based learning. Having a good percentage of achieving science process skills means that the learning outcomes obtained by students are also better, as indicated by student completion, which reached 89.47%.

## Conclusions and Recommendations

There is a strong and positive relationship between learning outcomes and students' science process skills in environmental change material for class X SMA Negeri 9 North Luwu.

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