

# The Relationship of Pedagogical Practices on Biology Online Learning With Learning Outcomes at High School During The Covid-19 Pandemic Octavian

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## The Relationship of Pedagogical Practices on Biology Online Learning With Learning Outcomes at High School During The Covid-19 Pandemic

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### ABSTRACT

This study aims to determine the relationship between pedagogic practice of biology online learning and student learning outcomes in class XI SMAN 9 Malang. This research was conducted from 02, October 2021 to 07, October, 2021 at SMAN 9 Malang. This research includes ex post facto research with quantitative research using survey mode with correlation analysis techniques in surveys, information is collected from respondents using questionnaires or questionnaires. Data analysis techniques in this study are collecting data, reducing data, presenting data, verifying and drawing conclusions. The results of this study are Biology online learning pedagogic practices have a significant relationship with student learning outcomes during the Covid-19 pandemic, but are at a very low level. This is indicated by a significance value 0.434 where  $0.575 > 0.05$ . In addition, based on the results of a simple correlation analysis obtained a correlation value of 0.103, which means the direction of the relationship is positive. Based on the results of research and discussion, there is a significant relationship between online learning pedagogic practices and student learning outcomes during the Covid-19 pandemic which is at a very low level. Because in the online learning process there are shortcomings, namely the lack of maximum student involvement, lack of learning time, teachers have difficulty determining whether students do assignments independently or not, so teachers must work as much as possible to adapt to the online learning process but these obstacles can be overcome properly due to assistance and motivation of various parties.

### KEYWORDS

Pedagogy  
 Biology Learning  
 Learning Outcome

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### 1. Introduction

Education is an effort to realize the ideals of the nation. Globalization has shifted the function of education which is not just educating the nation's life but generations are required to master various kinds of knowledge, skills and have good morals (Hidayatullah, 2017). Currently, Indonesia is facing the outbreak of the Covid-19 virus. The Ministry of Education has circulated a circular letter of the Minister of Education and Culture no 4 of 2020 concerning the implementation of education policies during the emergency period of the spread of coronavirus disease (covid-19). The teaching and learning process is carried out from home using applications with various provisions listed, some countries reported that among those who adopted online learning. Online (in the network) refers to the istila of opening cyberspace, everything related to the internet that facilitates activities without requiring excessive time and involves communication tools and supporting applications such as mobile phones and computers. In addition, ideally online learning can require learning to build and create knowledge independently, collaborate with other learners in building their knowledge and solve problems together, forming an inclusive learning community, utilizing website / website media that can be accessed via the internet, computer-based learning, virtual classes or digital classes (Chusna et al. 2020)

Anugrahana, (2020). The weakness in online learning is the lack of maximum student engagement. The involvement of the students in question can be seen from the results of student involvement in participating in full online learning from the beginning of learning

to the end of learning. During online learning there are several obstacles, the first obstacle if students feel boredom, teachers must think of strategies on how teachers should be creative in creating interesting online learning for students. One of them is biology, biology is the natural science of living things or scientific studies of life.

Biology learning is a learning process that concerns the relationship between living things and their environment. A learning process that is always related to real-world activities. So that there is interaction between students and students, students with teachers, and students with their environment. Thus, students are expected to be able to blend with their environment, blend with their ecosystem, and the most important thing is that students are able to solve problems related to biology in their environment. This means that the interaction of various components around is the scope of effective learning elements that affect the achievement of learning goals. So biology learning should take place outside the classroom, for example school yards, fish ponds, rice fields or even fruit and vegetable markets and laboratories. Students really need competent teachers, one of the competencies that must be possessed by teachers or teachers, one of which is pedagogic.

The pedagogic practice of the teacher has an effect on student activity, motivation and success learning outcomes in students. Pedagogic practices carried out by teachers can be seen in designing learning, implementing learning, designing and implementing learning evaluations, and developing students based on academic and non-academic potential. The pedagogical success of teachers will be seen in students who have values above KKM followed by motivation and interest in learning, there is curiosity, courage to argue, solve problems, feel happy to follow learning, confident, have good manners, obey rules, and students have a leadership spirit and are adaptable (Putri, 2018). As for based on research from Ahmad (2020), that pedagogic practices affect teacher professional adjustment and are required to be more dynamic and creative in developing the learning process of students with the strategies and methods used in the learning process.

According to Yulianto (2020). In the learning process, "the component teacher has been considered to greatly affect the learning process in education is the teacher, because the teacher is the spearhead who deals directly with students as subjects and objects of learning, no matter how good and ideally the educational curriculum without being balanced with the teacher's ability to implement it, everything is less meaningful. A good teacher is a responsible teacher, the teacher will be able to carry out his responsibility if he has the necessary competencies Every responsibility requires a certain amount of competence. In Law No. 14 of 2005 concerning Teachers and Lecturers article 1 paragraph 10 it is stated "Competence is a set of knowledge, skills and behaviors that must be possessed, lived and mastered by teachers in carrying out their duties professionally.

National Education Standards, the explanation of Article 28 paragraph (3) points stated that pedagogic competence is the ability to manage student learning which includes understanding of students, designing and implementing learning, evaluating learning outcomes, and developing students to actualize their various potentials. Pedagogic competence is the ability of teachers in managing student learning, including: classroom management, student learning strategies, technology utilization and assessment.

Indicators are quite important to know the achievement of learning objectives can be known the high and low learning outcomes obtained by students. According to Anni (2012), learning outcomes are changes in behavior obtained by students after experiencing learning activities. The acquisition of student change depends on what the learner learns. Learning outcomes are something that produces changes in students, those changes can be in the form of understanding knowledge, skills and attitudes. In accordance with the taxonomy of learning objectives proposed by Benjamin S. Bloom, learning outcomes are distinguished in three aspects, namely, cognitive aspects, affective aspects, and psychomotor aspects.

Learning outcomes can be seen from students' daily test scores and general tests. Many factors affect the learning outcomes achieved by students, namely internal factors such as children's intelligence, learning ability, and children's learning readiness. And external factors such as school, family, and environment. Among some of the statements above, it

can be concluded that to obtain satisfactory student learning outcomes, one of them requires qualified and competent teachers. Based on this explanation, it can be concluded, operationally, the ability to manage learning contains three managerial functions, namely planning, implementation, and control. In order for the learning process to be carried out effectively and efficiently, and achieve the expected results, learning system management activities are needed, as a whole process to carry out learning activities effectively and efficiently.

However, based on the results of an interview with biology teacher of SMA Negeri 9 Malang conducted by the author on June 16, 2021, since the outbreak of the Covid-19 virus in Indonesia, the process of Teaching and Learning Activities at SMA Negeri 9 Malang has all been carried out online starting from March 2020. Teachers must work as much as possible to adapt to the online learning process where online learning here is the first time so that teachers also prepare themselves and try to deliver the material as much as possible so that the learning objectives are as desired as planned according to the semester program. The activities carried out in the online learning process using the e-front application. However, in learning students and teachers are less interactive in communicating due to less optimal time, if students have problems with understanding that is lacking in the learning process, how many students ask more personally to the teacher compared to virtual learning directly.

Online learning in the classroom is less effective because of limited time, for example the learning that is applied now is conceptual learning, limited face-to-face learning or rarely online face-to-face meetings such as using (zoom meetings) can not even do practicum directly. It is seen from the results of student learning that there are still students who have grades under KKM, to improve grades students usually do remedial, regarding this there are some students who need to be reminded continuously to collect assignments online.

Online learning also affects student activities and learning outcomes which can be seen from cognitive, psychomotor and affective aspects. What can be seen from the teacher's pedagogic practice is learning planning strategies, student motivation approaches, increasing learning activities and providing an interactive learning environment with students. Based on the description of the problem above, the author is interested in taking the research title "the relationship between Pedagogic Practice of Biology online learning with the learning outcomes of grade XI students at SMA N 9 Malang during the Covid-19 Pandemic."

## 2. Method

This research includes *ex post facto research*, meaning research on variables whose occurrence has occurred before the research was carried out. The study was conducted by referring backwards to find out the factors that caused the event without giving treatment or manipulating the variables studied. This study aims to find out information about the paractic relationship of pedagogic competence with the learning outcomes of grade XI students of SMAN 9 Malang. This type of research is quantitative research with a quantitative approach that aims to detect the extent of variations in one or more other factors. In this case, it is the correlation of the relationship between teacher pedagogic practice competence to the learning outcomes of SMA Negeri 9 Malang students. Based on the title raised and existing problems The author uses *survey* methods with correlation analysis techniques in *surveys*, information is collected from respondents using questionnaires or questionnaires. Generally, the definition of *survey* is limited to research whose data is collected from a sample of the population to represent the entire population.

The variables in this study are: pedagogic competence as an independent variable and learning outcomes as a dependent variable. In terms of the learning process, pedagogic competence is the teacher's ability to manage student learning (Ninik, 2015). This is the most important part to be realized by every teacher in educating the nation's life. Indicators of teacher pedagogic practice in this study use indicators from Hidayat (2019). a. classroom management, b. learning strategy c. student learning, d. utilization of technology and c.



assessment / assessment. According to Bloom in Rusmono (2014) is behavior change which includes three domains, namely the cognitive, affective, and psychomotor realms. This ability can be seen from the learning outcomes obtained by students after participating in online Biology learning. The learning outcomes used in this study are the results of daily learning of grade XI students of SMA Negeri 9 Malang during the Covid-19 pandemic.

The population in the study was grade XI students of SMA Negeri 9 Malang which amounted to a population of 144 students with 4 classes of 36 students per class. In this study, the author took a sample of several grade XI students at SMAN 9 Malang with *random sampling techniques*. The sample was taken based on Suharsimi Arikunto's opinion, that is, if the subject is less than 100, it is better to take all. Furthermore, if the population is large or more than 100, 10% - 15% or 20% - 25% or more can be taken as a research sample. The sample in this study was taken 23% of the time because there were several researchers who conducted research at the same time using the same population so that to reduce student activity, the subject teacher suggested taking a minimum sample, from the total number of students, which was 144 students, so that the total number of samples in this study was 32 students. When the subject is less than 100, it is better to take it all. Furthermore, if the population is large or more than 100, it can be taken 10% - 15% or 20% - 25% or more (Arikunto 2010). In this study, the author took a sample of 23% of 144 populations by means of  $32/144 \times 100\% = 23\%$ .

Data analysis techniques in this study use descriptive statistical analysis and inferential statistics. Sugiyono (2013) descriptive analysis is statistical to analyze data by describing or describing the data that has been collected as it is without intending to make generalized conclusions or generalizations. While Sugiyono (2013) inferential analysis is a citation technique used to analyze data and samples and the results are treated for the population. While Sudjono (2008) inferential analysis is a statistic that is used as a tool in drawing general conclusions from a set of data that has been compiled and processed. After the data was collected completely, data analysis was carried out to calculate the percentage of respondent answer data, in this study researchers used percentage descriptive techniques with the formula proposed by Sudjono (2008). Obtain the percentage of pedagogic practice variables using the following formula:  $P = \frac{f}{N} \times 100\%$  with categories 0% to 100%. As for the category of teaching results in this study using the results of daily repeat learning from three sub-materials, namely (Y1) cells, (Y2) tissue structure and function in plants and (Y3) tissue structure and function in animals. Which will then be correlated using *IMB SPSS 25*, before being correlated, prerequisites will be tested to determine data distribution.

The requirements test used is a normality test used to re-examine the sample data that has been found with the aim of whether the data population has a distribution of normally distributed data or not. A significant level for accepting or rejecting the normal decision or not of data distribution is by comparing the *value of asymp sig (2-tailed)* with the value of  $\alpha = 0.05$ . The normality test aims to determine whether in the correlation model, the dependent variable and the independent variable both have a normal distribution or not (Sujarweni 2015). The data normality test in this study was carried out using the one-way Kolmogorov-Smirnov test.

According to Jonathan Sarwono (2011), correlation is an analytical technique included in one of the measurement techniques of association / relationship (*measures of association*). The use of *product moment correlation* to express the presence or absence of a relationship between variable X and variable Y and to include the amount of contribution of one variable to another. The correlation test in this study uses the correlation of moment products, with the criteria for interpreting the correlation index according to Sugiyono (2017) 0.80-100 very strong category, 0.60-0.799 strong category, 0.40-0.599 strong enough and 0.20-0.399 low.

### 3. Results and Discussion

#### Test Requirements

To see the normality of the data, a normality test will be carried out as a condition for parametric tests. Meanwhile, to determine the relationship between the variables of pedagogic practice of biology online learning on student learning outcomes, a correlation test will be carried out with the help of the SPSS program.

#### Normality Test

The normality test aims to find out whether in the correlation model, bound variables and independent variables both have normal distributions or not (Sujarweni 2015). This normality test was performed statistically using one sample kolmogrov-smirnov (K-S) analysis. iji K-S is done by making hypotheses.  $H_0$  : normally distributed residual data  $H_a$  : abnormally distributed residual data. If the significant value  $> 0.05$ , then  $H_0$  is accepted, meaning that the residual data is distributed normally, and vice versa, if the significance value is  $< 0.05$ ,  $H_0$  is rejected, meaning that the residual data is abnormally distributed (Ghozali, 2018). The results of the normality test in this study based on the results of the normality test, the data declared normal which is described in Table 4.6, from the normality test obtained a significant value of  $0.200 > 0.05$   $H_0$  is accepted which means that the data is normally distributed.

#### Correlation Test

A correlation test was conducted to determine the relationship between the pedagogic practice of Biology online learning with student learning outcomes using the IBM SPSS Statistics 25 program. The results of the correlation test between the pedagogic practice of Biology online learning and the learning outcomes of grade XI students of SMAN 9 during the COVID-19 pandemic are known that between the pedagogic practice of Biology online learning and student learning outcomes when viewed from person correlation shows that between the two variables have significance with a value of  $0.575 > 0.05$  which has a very weak relationship with an r value of 0.103 with a very low category. This suggests that the relationship between pedagogic practice and student learning outcomes is low.

#### Pedagogic Practice of Online Biology Learning and the learning outcomes

The implementation of learning at SMA Negeri 9 Malang, takes place online (online learning), this has been implemented from the beginning of the government implementing WFH (work from home). The process in teaching and learning in biology subjects, the school uses e-front applications, google meet, zoom and whatsapp. The following are the results of research obtained from respondents with a sample of 32. To find out the number of scores, categories, frequencies, and percentages obtained in the pedagogic practice of biology online learning and the learning outcomes of grade XI students of SMAN 9 Malang during the COVID-19 pandemic, it will be explained in the following table 1:

Table 1. Percentage of Pedagogic Practice of Biology Online Learning from Five Indicators

No	Indicator	Total Score	Percentage
1.	Classroom management	428	66,9%
2.	Learning strategy	412	80,5 %
3.	How students learn	792	66,4%
4.	Technology utilization	278	72,4%
5.	Assessment	325	63,5 %
<b>Average percentage</b>			<b>69,9%</b>

The overall data source in table 1 describes the results obtained from the five aspects measured in the pedagogic practice of online learning. Using 25 statement items in the form of questionnaires from 32 respondents or a sample of a total of 144 populations. In the aspect of learning strategy obtained a total of 412 scores with 80.5% which was included in the very good category, followed by the aspect of technology utilization obtained 278 scores with 72.4% of the good enough category, in the aspect of classroom management obtained 428 scores with 66.9% of the good enough category while in the aspect of learning students obtained 792 scores with 66.4% of the good enough category and in the assessment aspect

obtained 325 scores with 63.5%. The total average score of the 5 aspects obtained 2,235 scores and the average percentage of the 37 aspects was 69.9%.

Based on the exposure of these data, it can be concluded that the pedagogical practice of biology online learning class XI SMAN 9 Malang obtained a percentage value of 69.9%, in table 3.5 the author describes the percentage level set, namely 50% - 74% included in the category of quite good. It can be said that the pedagogic practice of biology online learning class XI SMAN 9 Malang is quite good. This is in line with the results of research conducted by Aditya, et al (2021) pedagogic competence in a class can be said to be good if teachers are able to meet pedagogic competence indicators and the results are felt by students by looking at student responses.

Learning outcomes are the abilities that students have after they receive a learning experience. Student learning outcomes are essentially changes covering the cognitive, affective and psychomotor fields oriented to the teaching and learning process experienced by students (Nana Sudjana, 2015). daily evaluation value of grade XI students of SMA N 9 Malang, first semester during the covid-19 pandemic. Daily tests are carried out after taking several subject matter including (Y1) cells, (Y2) tissue structure and function in plants and (Y3) tissue structure and function in animals. For students, daily test scores can be used to track their learning progress, be an encouragement to study harder and to find out whether the way they have done learning is right or not.

*The relationship between the pedagogical practice of biology online learning with the learning outcomes*

The results of the questionnaire data analysis showed that the average pedagogical competence of teachers of class XI Biology subjects at SMA Negeri 9 Malang was 69.9%, teachers received quite good criteria from respondents. Most respondents received a very good response. This is supported by the 5 indicators of pedagogic practice in Biology learning during the pandemic, namely classroom management with a percentage of 66.9% of good quality, 80.5% very good learning strategies, 66.4% good student learning methods, 72.4% good use of technology and 63.5% good assessment. The learning outcomes of Biology class XI students showed that from 32 samples had predominantly high and satisfactory learning outcomes or above average. This shows that the trend of Biology learning outcomes of grade XI students of SMA Negeri 9 Malang is classified as quite good.

The results of research data analysis that has been conducted using IBM SPSS 25 show that there is a significant relationship between the pedagogic practice of Biology online learning and student learning outcomes, but at a very low level. This is indicated by a significance value of 0.575 where  $0.575 > 0.05$ . In addition, based on the results of a simple correlation analysis, a correlation value (r) of 0.103 was obtained. Based on the criteria for interpretation of the correlation index criteria according to (Sugiyoni 2010) 0.00-0.199 shows a very low correlation index level, so based on the results of the correlation data analysis above, it shows that the relationship between the pedagogic practice of Biology online learning with the learning outcomes of grade XI students of SMAN 9 Malang is very weak. Pedagogic practice is closely related to learning outcomes.

High learning outcomes are seen from pedagogic practice in implementation through teacher and student interaction. Umani (in Aziz, 2017) explained that the achievement of learning outcomes obtained by students is an important factor seen from the teacher's personality and attitude, the level of teacher knowledge, methods and strategies used. This research is in line with research conducted by Aziz (2017) explaining that mastery of material, structure, concepts and mindsets is in a very low category with a percentage of 20.29% with a frequency of 125 students. Online learning that is properly implemented can increase students' scientific literacy so that it can have a positive impact on learning outcomes Banila, Lestari, & Siskandar. (2021). Online learning and face-to-face learning have different implementations as in online learning time is reduced.

Mastery of the material is one of the learning objectives and student learning success in applying appropriate pedagogic practices. However, in Lindawati's research, I (2022), the weakness of online learning is that it is difficult to implement if the facilities and infrastructure do not support: uneven internet access in every place, uneven facilities owned



by students. Teachers' adaptation to online learning during the Covid-19 pandemic includes digging for information to increase their understanding of the online learning process through supporting internet media such as Google, YouTube and WhatsApp in the adaptation process inseparable from the constraints of lack of time, but these obstacles can be overcome properly due to the help and motivation of various parties.

#### 4. Conclusion

Based on the results of research and discussion, there is a significant relationship with student learning outcomes during the Covid-19 pandemic, which is at a very low level. This is indicated by a significance value of 0.575 of which  $0.575 > 0.05$ . In addition, based on the results of a simple correlation analysis, a correlation value of 0.103 is obtained, which means the direction of the positive relationship. The percentage of pedagogic practice is quite good where the average percentage of pedagogic practice in online learning is 69.9%, this is supported by the relatively high learning outcomes of grade XI students of SMAN 9 Malang.

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