Journal of Biology Learning
Vol. 5., No. 1, March 2023, pp. 01-07
ISSN 2623-2243 (print), 2623–1476 (online)
http://journal.univetbantara.ac.id/index.php/jbl/index

The Effect of *Hybrid* Learning Learning Strategies Applied to the Discovery Learning Model on Student High Order Thinking Skills

Meliana Paryanti [a,1,*], Mufida Nofiana [b,2]

[a] Faculty of Teacher Training and Education, University of Muhammadiyah Purwokerto, Banyumas 53182, , Indonesia,
[b] University of Muhammadiyah Purwokerto, Jl. KH. Ahmad Dahlan, Dusun III,, Dukuhwaluh Banyumas 53182, Indonesia
[1] melianaparyanti15@gmail.com*; [2] mufidanofiana@ump.ac.id
* Corresponding Author

Received January 16, 2023; accepted March 22, 2023 ; published March 30, 2023

ABSTRAK

This study aims to determine the effect of hybrid learning strategies applied to the discovery learning model on students' high order thinking skills. This type of research is quantitative research using quasi-experimental methods. The research design used was post test only control group design. The data collection methods used are tests and documentation. The research instrument used is a test question sheet in the form of multiple-choice questions developed based on the HOTS question grid. There are 2 data analysis techniques used, namely 1) Prasyarta tests include homogeneity tests and normality tests, 2) Hypothesis tests include T-tets tests, F tests, and eta tests. The results showed that from the T-test there was a difference in the average HOTS score of control and experimental class students with sig scores. 0.000, the F test shows that there is an influence with the sig value. 0.000, and the Eta test shows that there is a moderate influence that can be seen from the correlation value of 0.544. It can be concluded from the use of Hybrid learning strategies on students' High Order Thinking Skills shows that there is a moderate influence on increasing student HOTS between control and experimental classes.

KEYWORD

Hybrid learning
High Order Thinking Skills
Discovery learning

1. Introduction

The COVID-19 pandemic has been going on for 2 years. The existence of COVID-19 has had a major impact on all sectors of human life, one of which is the impact on the education sector, making schools closed and students studying independently at home or SFH *(*study from home*)*. The impact of this policy, according to science teachers at SMP N 1 Kembaran, resulted in students becoming lazy to study, decreasing student learning achievement, and students' high thinking skills also reduced. Conditions like this make the government conduct an assessment related to the impact that occurs due to learning carried out in SFH (study from home) by issuing a Joint Decree (SKB) of 4 Ministers in 2022 related to Guidelines for Implementing Learning during the Covid-19 Pandemic.

The Ministerial Decree 4 policy requires education units in carrying out learning activities to pay attention to their area zones. Schools in level 1 and 2 zones can hold limited face-to-face learning by always observing the strictly applicable health protocols, while schools in level 3 and 4 areas cannot conduct limited face-to-face learning and must implement distance learning (PJJ).

In-class learning in limited face-to-face learning (PTM) can only be carried out with a percentage of 50% of the total number of students in the class (Ministry of Education and Culture, 2022). The limited number of students makes the learning process ineffective. In addition to the limited number of students, limited PTM causes limited learning hours so that interaction between students and teachers is reduced, because it is limited in time so that students' higher-order thinking skills are reduced. Conditions like this result in schools conducting blended learning that can be adjusted to current conditions so that learning objectives are still achieved. The use of blended learning models can improve students' higher-order thinking skills (Agusta, 2021). A blended model that can be used as a solution to facilitate the resolution of problems faced now can be designed a hybrid learning strategy that allows students to learn at school and at home simultaneously. In line

with the results of research from Wahyuni (2021) which states that the use of hybrid learning is proven to have an effect on improving student learning outcomes.

Hybrid learning strategy is a combination of face-to-face learning *in* the classroom and online learning using media such as computers, mobile phones (Dwiyogo, 2018). Hybrid learning teachers can also monitor two classes directly, namely face-to-face classes in class and online classes that use media such as zoom or google meet. Shibley (2011) states that hybrid learning focuses on changing learning that is usually done so that students are more active in participating in the face-to-face learning process or not. The hybrid learning strategy can be a solution in limited face-to-face *l*earning due to the 50% PTM rule. Yapici and Akbayin (2012) stated that hybrid learning has advantages, namely flexibility in learning time, has an influence on improving learning outcomes, increasing student interest in learning, and increasing student interaction.

SMP Negeri 1 Kembar in the implementation of science learning, especially online biology material, has been using the school LMS or school website. The teacher did not give a direct explanation of the material. The results of interviews obtained with science teachers at SMP Negeri 1 Kembaran, the majority of learning activities carried out by teachers only load material in the form of videos, modules, powerpoints in the LMS to be accessed by students. Learning like this is not effective because students are not interactive in learning due to the constraints of networks, devices, and learning that teacher center learning results in students' High Order Thinking Skills not being facilitated.

Hamidah (2018) stated that High Order Thinking Skills is a high thinking skill that not only requires abilities such as remembering, but also requires other higher abilities. High Order Thinking Skills include the ability to solve problems, to think creatively, to think critically, to argue or argue, and to make a decision. Ernawati (2017) stated that the ability to think higher order is no longer just a method of memorization but must understand the meaning contained in it.

Discovery learning is a learning model that involves students in the process of solving problems to develop students' knowledge and skills (Effendi, 2012). Discovery learning is a two-way learning model, involving students in answering questions from the teacher where students mean discovery, while the teacher is tasked with guiding students in the learning process in the right direction (Rutonga, 2017). Discovery learning indirectly also makes students indirectly more creative and critical in their thinking process, this model is also able to make students more independent in looking for a conclusion. In some uses of the discovery learning model in learning, there is an increase in better learning outcomes (Prilliza et al, 2020). This can happen because students are required and given the opportunity to seek and find knowledge independently so that teaching and learning activities seem meaningful.

Research on the effect of hybrid learning strategies applied to the discovery learning model on high order thinking skills has never been carried out in SMP Negeri 1 Kembaran. The use of hybrid learning strategies is used to facilitate science subjects, especially in Biology science material during limited PTM periods. Therefore, it is necessary to conduct research entitled "The Effect of Hybrid Learning Learning Strategies Applied to the Discovery Learning Model on Student High Order Thinking Skills".

2. Method

The research to be carried out is a type of quantitative research. Quantitative research is a research method based on the philosophy of positivism used to examine a population or a sample and aims to test hypotheses (Sugiyono, 2013). This research uses a quasi-experimental method, which is to estimate the situation that can be achieved by actual experiments, but there is no manipulation of all relevant variables (Subrayat, 2018). This study used a post-test only control group design.

The population used is grade VIII students of SMP N 1 Kembar who are carrying out learning on KD material. 3.9 Human Excretory System. Sampling is done using cluster random sampling technique. The data collection methods used are tests and documentation. The test questions used are multiple-choice form questions developed based

on the HOTS question grid. There are 2 data analysis techniques used, namely, 1) prerequisite tests including normality tests and homogeneity tests, and 2) hypothesis tests include, t-test, F test, and eta correlation test.

3. Results and Discussion

There are 2 prerequisite tests conducted in this study, namely, the normality test and the homogeneity test along with the results of the two prerequisite tests:

Normality Test

The normality test is used to determine whether the values of the control class and experimental class are normal.

Table 1. *Post Test* Normality Test Results in Control Class and Experimental Class

Class Data	*Significance Value*	*Meaning*
Control class	0,164	Normal distributed data
Experimental class	0,67	Normal distributed data

Based on the normality test Table 1 sig values. It is known that the control class is 0.164 > 0.05 which means that the data is normally distributed, while the value of Sig. The experimental class is 0.067 > 0.05 which means that the data is normally distributed.

Homogeneity Test

The homogeneity test is used to determine whether the values of the control class and the experimental class are homogeneous.

Table 2. *Post Test* Homogeneity Test Results in Control Class and Experimental Class

Class Data	*Significance Value*	*Meaning*
Control class and Experiment class	0,989	Homogeneous data

Based on the homogeneity test of the post test value of Table 2, it can be seen that the value of sig. 0.989 > 0.05 which means homogeneous data.

Test the Hypothesis

The hypothesis test was conducted to determine whether there is an influence of the discovery learning model with hybrid learning strategies on students' high order thinking skills. The hypothesis tests used are the T-Test, F test, and eta test, following the explanation of each test below:

The T-test was conducted to determine the difference in average scores between the control class and the experimental class.

Table 3. *Post Test T-Test* Results in Control Class and Experimental Class

Class Data	*Significance Value*	*Meaning*
Control class and Experiment class	0,000	There is an average difference

Based on the T-Test test, Table 3. shows the results that between the dick class and the experimental class have a sig value. 0.000 means that there is a difference in average high order thinking skills between the control class and the experimental class after being treated with hybrid learning strategies.

b. F Test

Test F was conducted to determine the effect of hybrid learning strategies applied to the discovery learning model on students' high order thinking skills shown in table 4.

Table 4. F *Post Test* Results in Control Class and Experimental Class

Class Data	*F Count*	*Significance Value*	*Meaning*
Control classes and experiments	26,063	0,000	There is a significant relationship

Based on Table 4 it is known that the F value is 26.063> of F count. Sig value. 0.000 < 0.05 shows that there is a significant influence on the use of hybrid learning strategies applied to the discovery learning model on students' high order thinking skills.

c. Eta Correlation Test

The results of the calculation of the eta test data post *test* values of the control class and the experimental class are shown in table 5.

Table 5. Eta Post Test Correlation *Test* Results in Control Class and Experimental Class

Class Data	*Correlation Coefficient Value*	*Meaning*
Control classes and experiments	0,544	Keep

Based on table 5 shows that the influence of hybrid learning strategies applied to the discovery learning model on students' high order thinking skills between the control class and the experimental class with a correlation coefficient value of 0.544. According to Misbahuddin and Hasan (2014), this value shows that there is a moderate influence of the use of hybrid learning strategies on high order thinking skills.

This study aims to determine the effect of hybrid learning strategies applied to the discovery laerning model on student HOTS. Sampling in this study used cluster random sampling technique. From the sampling technique, 2 classes were obtained that would be used as research objects, namely the control class and the experimental class. Discovery Learning on High Order Thinking Skills of Students.

Learning in experimental classes using the Discovery learning model using Hybrid learning. At the time of class learning is divided into 2, namely online classes and offline classes that conduct learning at the same time. Learning carried out on students who attend online is assisted by Google Meet media, while students who attend class (offline) learning directly or face-to-face. Learning in experimental classes using discovery learning models with hybrid learning is carried out in accordance with the discovry learning syntax. Learning begins with an introductory activity, namely distributing learning modules to students. Students who attend online are given digital modules, while students who attend offline are given modules in printed form. Furthermore, the core activities carried out are carried out in accordance with the discovry learning syntax.

The first core activity of providing stimulation (stimulation) teachers show videos to students with the help of LCD for offline students, while for students who are present online show videos with share screens on google meet where the device is directly connected to the LCD in offline classes. The second activity in problem statement is that students identify problems that are on video by doing questions and answers, then after that, LKPD discussions are carried out. The third activity in data collection divided the students who attended online into several breakout room groups at the goole meet that had been created to conduct discussions. Discussion activities in class are guided using LKPD. LKPD contains activities that students must do during the discussion process in class. The provision of LKPD aims to maximize students' understanding of the material provided in accordance with learning indicators. There are 4 LKPD given to students. LKPD is also given to involve students to be active in participating in learning so that the learning process is not only dominated by teachers but students are actively involved in learning, and can improve students' high order thinking skills.

In the fourth activity of data processing (data procesing) the teacher guides students during solving or solving problems in LKPD. The fifth activity in verivication students presented the results of the discussion and the teacher gave material reinforcement to students. Activities to eman in the process of drawing conclusions (generalization) students conclude the material that has been delivered by the teacher.

Learning in the control class of students who attend class learning is only half of the number of students or 50% of students, and students who are 50% of them study online at home. Control classroom learning for students who attend class directly using the usual discovery learning learning model. Learning is carried out according to the syntax of the discovery learning learning model. Online student learning is carried out only by

providing material in the form of digital modules, powerpoint, LKPD and evaluation through whatssap class groups. So students who learn online do not get supervision from the teacher when learning.

Evalusai or post test is given to students after learning is completed in both experimental and control classes. There are 2 post tests for meeting 1 and meeting 2. The post-test value data obtained from both meetings was then tested. Post-test data was tested to determine whether there was a difference in high order thinking skills scores between control class students and experimental classes after being treated.

The test results from the post-test data show that between the control class and the experimental class have a noticeable difference can be seen in (Table 3). This means that there is a difference in high order thinking skills between the control class and the experimental class. In (Table 4) shows from the results of test F that there is an influence of the use of hybrid learning strategies applied to the discovery learning model on students' high order thinking skills with moderate influence (Table 5). This result is in line with Saefullah's research (2020) which states that learning using bleanded learning has an effect on increasing HOTS which is better than learning without bleanded learning. Gultom (2021) stated that there is a significant influence of hybrid learning on students' high order thinking skills.

Hybrid learning is a learning that combines online and face-to-face learning into one (Snart, 2010). So learning is done by dividing students 50% to learn online and 50% students to learn offline or face-to-face. Hybrid learning is suitable for limited face-to-face learning because this method is effective and efficient for learning in limited face-to-face learning, given the limited number of students who can come to school to participate in face-to-face learning. Rahayu (2021) stated that the implementation of hybrid learning during the Covid-19 pandemic can be carried out very well.

The hybrid learning strategy in the experimental class makes offline students and online students can learn simultaneously, so that learning becomes more effective and interactive. Wahyuni (2021) stated that the advantages of hybrid learning include: 1) students can learn more in online sessions that are added to traditional learning and can increase student interaction, 2) students are equipped with various choices to support learning, and the opportunity to access learning can improve what students learn, 3) data presentation is faster to be conveyed to students who learn Using e-learning and, 4) learning is not only one direction, because with the hybrid learning model students have the same opportunity to learn, as well as flexible learning schedules and times. High order thinking skills of students can be facilitated by carrying out hybrid learning strategies because students can learn independently through various available learning resources, guided discussions, problem solving can be directed between the two classes, and both facilitated by the teacher.

The moderate influence of the use of hybrid learning learning strategies obtained can also be influenced by the syntax of the discovery learning model that facilitates students' high order thinking skills. The syntax of the discovery learning model that can facilitate students' high order thinking skills is that in the syntax of problem identification (problem statement) in this activity students are invited to discuss to solve a problem, with this students are asked to think high. The application of the discovery learning learning model can also increase the learning activities of junior high school students in Biology (Istilah Winatun, 2021). In addition, the discovery learning learning model can also improve students' ability to solve a problem (problem solving) through the process of stimulation, data collecting, data processing, verivication, and generalization. The discover learning model used is relatively capable of creating a good discussion atmosphere so that it can facilitate students' high order thinking skills. So if it is concluded with hybrid learning, learning becomes better because learning does not only go one way so that learning is more interactive

4. Conclusion

Based on the results of research that has been conducted, it can be concluded that there is a moderate influence from the use of hybrid learning learning strategies applied to the discovery learning model on the high order thinking skills of students at SMP Negeri 1 Kembaran. The discover learning model used is relatively capable of creating a good discussion atmosphere so that it can facilitate students' high order thinking skills.

References

Agusta, A.R, Suriyansyah, A., & dkk. (2021). Model Blended Learning Untuk Mengembangkan Keterampilan Berpikir Tingkat Tinggi . *Journal of Economic and Entreprenurship*.

Dwiyogo, W. D. (2018). *Pembelajaran Berbasis Blended Learning*. Depok: Raja Grafindo Persada.

Effendi, L., A. (2012). Pembelajaran Matematika dalam Model Penemuan Terbimbing untuk Meningkatkan Kemampuan Representasi dan Pemecahan Masalah Matematis Siswa SMP. *Journal of Penelitian Pendidikan*, 13 (2).

Ernawati, L. (2017). *Pengembangan High Order Thinking (HOT) melalui metode pembelajaran Mind Banking Dalam Pendidikan Agama Islam. PROCEEDINft, 189.*

Gultom, S.T, & dkk (2021). Pengaruh Pembelajaran Hybrid Lerning PBL Pada Keterampilan Berpikir Tingkat Tinggi Siswa Kelas VII dalam Pemanasan Global Dan Sikap Peduli Lingkungan. *Jurnal Penelitian Pendidikan IPA*.

Hamidah, L. (2018). *Higher Order Thinking Skills: Seni Melatih Kemampuan Berpikir Tingkat Tinggi*. Temanggung: Desa Pustaka Indonesia.

Istilah Wintaun. (2021). Peningkatan Aktivitas dan Hasil Belajar Biologi Melalui Model Pembelajaran Discoery Learning Pada Siswa SMP. *Journal of Biology Learning*

Kemendikbud. (2022). *Surat Keputusan Bersama (SKB 4 Menteri) berkaitan dengan Panduan Penyelenggaraan Pembelajaran di Masa Pandemi Covid-19.*

Misbahuddin & Hasan, Iqbal. (2014). *Analisis Data Penelitian dengan Statistik*. Jakarta: PT Bumi Aksara

Prilliza, M. D., Lestari, N., Merta, I. W., & Artayasa, I.P. (2020). Efektivitas penerapan model discovery learning terhadap hasil belajar IPA. *Jurnal Pilar Mipa,* 15 (2), 130.

Rahayu, E., & dkk. (2021). *Pelaksanaan Hybrid Learning Dalam Pembelajaran IPA Pada Masa Pandemi Covid-19*. PROSIDING

Rutonga, R. (2017). *Penerapan model discovery learning untuk mengingkatkan hasil belajar IPA. Rudi Rutonga Pendidikan sangat berperan penting dalam pengembangan Sumber Daya Manusia, dengan pembaharuan dan peningkatan kecanggihan ilmu pengetahuan, saat ini membuat bangsa Indones*. 1 (2)

Saefullah, A., Fitriyani, A., & dkk. (2020). Blended Learning Pengaruhnya Terhadap Higher Order Thinking Skills Pada Materi Termodinamika. *Indonesian Journal of Science and Mathematics Education.*

Shibley, dkk,. (2011). Designing a Blended Course: Using ADDIE to Guide Intructional Design. *Journal of Collage Science Teaching 4.0, 80–85.*

Snart, J.A,. (2010). *The Perils and Promise of Blending Online and Face-to-Face Instruction in Higher Education*. PREAGER.

Subrayat, S. (2018). *Metodologi Penelitian*. Depok: Rajagra PT

Sugiyono. (2013). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.

Wahyuni, A.S,. (2021). Penerapan Model Hybrid Learning Dalam PTM Terbatas Untuk Meningkatkan Motivasi Dan Hasil Belajar Siswa. *Indonesian Journal of Education Development Vol 2 Nomer 3.*

Yapici, I. U., & Akbayin, H. (2012). The Effect of Blended Learning Model on High School Students' Biology Achievement and on Their Attitudes towards the Internet. *Turkish Online Journal of Educational Technology-TOJET*, *11*(2), 228-237.