The Influence of the Discovery Learning Model on the Ability to Analyze in Students at STKIP Taman Siswa Bima

Nurhikmah[1]

[1] Sekolah Tinggi Agama Islam Sumbawa, Indonesia; hikmahnurbima97@gmail.com

ARTICLE INFO

ABSTRACT

Discovery Learning is based on cooperative learning, students are challenged to discover and develop their own knowledge, knowing its meaning through their study groups. This study aims to determine the influence of the discovery learning model on students' ability to analyze social studies learning at STKIP Taman Siswa Bima. The type of research used is pre-experimental design. The population in the study was students at Elementary School Teacher Education semester 3 STKIP Taman Siswa Bima, with a sample of 103 students. The sampling technique used is simple cluster random sampling. The analysis technique used descriptive statistics, prerequisite test with equivalence test, homogeneity test and normality test, hypothesis test using the Paired Sample t-Test and the Independent Sample t-Test with a significance level of 0.05. The results of the study show that the Problem discovery learning model has a positive and significant effect on students' ability to analyze social studies learning at STKIP Taman Siswa Bima, based on the results of the Paired Sample t-Test, a sig value of $0.000 < 0.05$ which means that it has an effect. The indicator that has the greatest influence is the first indicator to determine the problem with a score percentage of 95%.

Corresponding Author:
Nurhikmah
Sekolah Tinggi Agama Islam Sumbawa, Indonesia; hikmahnurbima97@gmail.com

1. INTRODUCTION

21st century learning changes the paradigm which in general presents a wider space for movement in the aspects of development and the duties of students as learning subjects, this is present as an implication of the development of high-level thinking skills (HOTS) which need to be optimized in the learning process as well as the learning principles in the 2013 curriculum (Syamsul, Basyaruddin, & Yuhdi, 2020). 21st century learning emphasizes how learners realize what they can do with the knowledge they gain and apply what they learn in a real-world context (Karatas & Zeybek, 2020). Some of the 21st century skills are critical thinking, collaboration or the ability to work well together, communication skills, and creativity (Mahrunnisya, 2023).

Thinking ability is an ability from mental processes including knowledge and recent works (Amin et al., 2020). The development of thinking that plays a role is a part of the brain, humans use these limbs as a source for thinking, to train abilities and skills in solving one or more problems that are global, national or personal, including problems in the world of education (Shaw et al., 2020). Analyzing problems is the ability to break down one or more learning topics into several parts and determine the relationship between topics/material parts as a whole (Firdaus & Aini, 2024). Nurhayati & Angraeni, (2023) also argue that analyzing problems is one of the thinking activities that is a skill required in 21st century learning. Including social studies learning at school and in college.

Social studies learning is an intra-sectional communication process that has a reciprocal nature between educators and students to achieve social studies learning goals (Rezania & Afandi, 2020). Social studies education has four comprehensive dimensions, namely the dimension of knowledge, the dimension of skills, the dimension of values, attitudes, and the dimension of action. Knowledge, skills, values, attitudes, and actions are dimensions in social studies education that are comprehensive. The dimension of ability or skill includes the ability to research, think, social participation, and communicate Therefore, in the lecture process, a high-level thinking process is needed, including the ability to analyze (Jamil & Aprilisanda, 2020).

Some facts in the field say that students are still lacking in thinking skills, including analyzing or solving problems. This condition occurs because students still like to do individual and group assignments in the form of papers with shortcuts, namely taking other people's work on the internet without first paraphrasing or analyzing the truth. This happens due to the difficulty of students in finding and solving problems. The results of previous research also show that prospective teachers (students) are still lacking in thinking skills (Uslu, 2020). This is because students have difficulty finding alternatives and choosing the right problem solving (Anugraheni, 2020). Apart from that, because the teaching and learning process is still too focused on the teacher. As said by Al Aliyawinata et al., (2021) that in the learning process, students' activities are in the form of taking notes, listening to the delivery of material from lecturers, completing assignments independently, so that there is a lack of involvement of students in the thought process to solve problems.

This problem needs to be overcome, educators need to change the learning strategy by using various learning models that are able to increase students' contributions and thinking skills (Yunus et al., 2021). The use of a model in the learning process has a major impact on student skills (Nurhikmah et al., 2022). The ability to think in analyzing in social studies learning can be developed, one of which is by applying the discovery learning model. The discovery learning model is particularly relevant to improve students' High Order Thinking Skills (HOTS) which consists of observing, questioning, trying, reasoning, and communicating as recommended by the 2013 curriculum (Al Aliyawinata et al., 2021).

Discovery learning is also known as exploratory learning strategies (Ilhan & Gülersoy, 2019). Discovery Learning is based on cooperative learning, materials and students are challenged to find their own knowledge and build it, knowing its meaning through their study groups (Mahendra, 2020). Discovery learning is learning that encourages students to wonder or propose hypotheses and find answers or questions or hypotheses submitted (Oktiana & Gani, 2022). (Aritonang & Astuti, 2021) The teaching and learning process uses the discovery learning model by providing a stimulus to emphasize student activities in learning and understanding one or more topics in detail that are carried out independently, having a positive impact on improving students' critical thinking skills. (Astari & Soro, 2022) also said that the improvement of critical thinking skills is influenced by the application of learning models, one of which is discovery learning. Through a series of discovery processes carried out independently, it can increase students' understanding of learning (Sugiarti & Husain, 2021). A study conducted by Chusni et al. (2020) shows that through the application of the discovery learning model, students are active, independent, and enthusiastic in finding learning assistants. And the implementation of the discovery learning model can be an effective strategy in improving the quality of learning in higher education (Fajrin et al., 2024). Therefore, the researcher wanted to find out the influence of the discovery learning model on the ability to analyze social studies learning at STKIP

Taman Siswa Bima. This study aims to determine the influence of the discovery learning model on students' ability to analyze social studies learning at STKIP Taman Siswa Bima.

2. METHODS

Quantitative research aims to obtain numerical data that is used as a calculation tool in obtaining a conclusion and proving the proposed hypothesis (Fitria et al., 2024). The type of research used is Pre-Experimental Design research, which is research that uses experimental classes without using control classes (Arikunto, 2010). The research design used was to use One Group Pretest-Posttest Design which only used measuring tools in the form of pretest and posttest in one experimental class (Meleong, 2011). The research began by conducting initial tests, then given treatment. After being given treatment, it was then ended by giving a final test. The population in this study is all PGSD students in the third semester of STKIP Taman Siswa Bima, in the Social Studies Learning Development course for elementary school which totals 103 students divided into seven classes. The sample of this study was taken using a simple cluster random sampling technique, which is a group sampling technique. Of the seven classes, two classes were selected as experimental classes. The selection of classes is based on the suitability of the hours, because in semester 3 for the Elementary Social Studies Learning Development course, it is scheduled on Saturday so that class B is selected which totals 53. The technique used in the data collection process in this study uses the ability to analyze test technique. Test techniques in the form of written tests that consist of essays to find out and obtain results of students' analytical skills. The instrument used in this study is an analytical ability test assessment sheet. The prerequisite test in this study used an equivalence test, a homogeneity test and a normality test with a significant value of >0.05. The hypothesis test in this study uses a t-test, namely the Paired t-test (Al Aliyawinata et al., 2021).

Table 1. Research Design

Pretest	Treatment	Posttest
O1	X	O2

Information: O1: Pretest (Results before treatment)

X: Treatment (Learning with Discovery Learning)

O2: Posttest (Results after treatment)

3. FINDINGS AND DISCUSSION

The first stage is to provide a pretest to students. The second stage is posttest after applying the discovery learning model in the learning process. Below is an explanation of the results of the pretest and posttest of analytical ability in students.

Table 2. Data Washing Pretest, Posttest

Pretest and post-test score data		
Description	Pretes	post-test
Average	19,57	36,55
Maximum score	30	43
Minimum score	11	28
Daviasi Standards	5,971	5,052
Number of respondents	21	20
Average increase	16,98	

Based on the results of the descriptive analysis in Table 2, the average pretest score of analytical ability was 19.57, but after being treated with the discovery learning model, the posttest score increased to 36.55. The increase occurred by 16.98.

Based on the results of the pretest and posttest, the ability to analyze based on the results of the average test has been tested. The average results of the pretest and posttest were categorized as sufficient to very good and there was an increase in each class. The results of the categories are presented in the form of the following table.

Table 3. Pretest & Posttest categories in each class

Categories of Pretest Posttest Results Analytical Ability in Experimental			
Class	Test	Rerata	Category
Eksperimen	Pretest	19,57	Adequate
	Posttest	36,55	Excellent

Figure 1 presents a table containing the katogeri at the time of testing, both before and after treatment. It is noted that the average in the pretest is only 19.57 in the adequate category, while the average posttest has increased, namely 36.55 in the excellent category.

After the analysis was obtained, the first indicator was obtained to determine the problem of obtaining a percentage of 95% value. The second indicator analyzed obtained a percentage of 85% of the score. The third indicator evaluates obtaining a score percentage of 77%. As for the fourth indicator, determining the solution obtained a score percentage of 76%. It can be seen from the percentage of values that the highest is the first indicator and the lowest is the last indicator.

Hypothesis testing uses a paired sample t-test. This test aims to test the influence of the discovery learning model on students' analytical skills. The hypothesis tested is whether there is a significant positive influence of the use of the discovery learning model on students' ability to analyse social studies learning at STKIP Taman Siswa Bima.

Table 4 Test Hypothesis with Paired Samples t-Test

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
			Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
		Mean			Lower	Upper			
Pair 1	Pretes class eksperimen - Postes class eksperimen	-16.700	6.097	1.363	-19.553	-13.847	-12.250	19	.000

Table 4 shows the analysis of the results of the Paired Samples t-Test, on pretest and posttest data in the variable discovery learning model. The value of sig (2 tailed) indicates 0.000. When compared, the value of the conditions that need to be met is 0.05. then 0.000≤0.05 so that it can be said that there is a difference in ability after being given treatment. Therefore, it can be concluded that the discovery learning model has a positive and significant effect on the ability to analyse students in social studies learning at STKIP Taman Siswa Bima.

This result is in line with the results presented by Gunawan et al., (2023), showing that the data was analyzed with a t-test and obtained sig. (2-tailed) 0.00 is smaller than equal to 0.05, so H1 is acceptable and H0 can be rejected which means that the discovery learning model thinks critically of learners. The findings of this study are that the syntax that most effects students' critical thinking skills is data collection that gives rise to three critical thinking indicators, followed by problem statement and verification with two critical thinking indicators. Apart from that, Al Aliyawinata et al., (2021) in their

research also showed that the discovery Learning model has an effect on students' ability to analyze by increasing the average pretest score from 52.23 to 69.47 in the average posttest score. The results of the Wilcoxon test were obtained Sig. (2-tailed) 0.000 < 0.05, then H0 is rejected so that it can be concluded that the discovery learning model affects students' analytical ability.

The data analysis test used in this study is a variance analysis test. This test aims to find out whether or not a model has an effect on learning. Based on the results of the data hypothesis test in the study, it can be concluded that the use of the discovery learning method has a positive and significant effect on the ability to analyze PGSD students in the third semester of STIKP Taman Siswa Bima. The indicator of analytical ability that has the highest score percentage is the first indicator, which is to determine the problem. This first indicator obtained a score percentage of 95%. Meanwhile, the second indicator, analyzed, obtained a score percentage of 85%. The positive influence on the indicator of analysis is caused by the type of student-centered learning, in the learning process the student involves himself during the learning process, both in searching, finding, and analyzing it so that it becomes a valid information. As stated by (Margiani & Pratiwi, 2023; Wiono & Meriza, 2022) in their research, said that by applying the discovery learning model, students become more active in discovering concepts and materials independently. The learning process is student-centered and students have the opportunity to create their learning experiences and knowledge for the students themselves. The third indicator evaluates the 77% score percentage, and the fourth indicator determines the solution to obtain a score percentage of 76%. This result is almost the same as the results of a study conducted by Prasetyo & Kristin (2020) to determine a 74% solution with very critical criteria.

As for what results in the discovery learning model, it has a positive and significant effect on students' ability to analyze. This is due to several factors. First, this model is one of the learning models that is student centered, where students play a more active role than their teachers. The role of teachers is only to guide the learning process according to the expected goals (Hidajat et al., 2023; Nurhikmah et al., 2022), while students who actively carry out the learning process start from determining to finding solutions to the problems learned (Hergüner, Yaman, Sari, Yaman, & Dönmez, 2021; Rihayati, Utaminingsih, & Santoso, 2021). The role of students who dominate learning activities in and outside the classroom affects the development of students' thinking skills in analyzing something they are learning.

Second, is the learning syntax applied by this learning model, which can deceive students' thinking ability to analyze a topic being studied. In addition, the use of experiential-based and interactive learning methods affects students' understanding of the issues being studied (Rahayu et al., 2024). The syntax or defense measures applied are the learning syntax that is obtained based on the opinions expressed by Elvadola et al., (2022), namely 1) stimulus, in this stage, in the learning process provides several topics to students, the topics are, "Teacher-student teacher interaction", "Social and emotional competence of teachers", "Teacher professional development". The assignment of several different topics aims to free students to choose the topics they want. 2) Problem statetment, in this second stage, students choose from several topics given by selecting material topics to be analyzed independently, providing opportunities for students to do assignments that are in accordance with their learning style and topics. The selection of topics that suit their desires, provides space to create their learning style and learning independence. 3) Data collection and processing, after the selection of topics, students carry out activities to search, collect, and manage data to be analyzed to answer the problem/topic being worked on. At this stage, the researcher provides several articles related to the topic being analyzed, but it is possible for students to find other information for their analysis in solving the topic/problem they are solving. Students' critical thinking skills play a very important role here to select various data that are suitable for the topic/problem to be analyzed, so that they can provide the right answers.4) Data verification and conclusion drawn. In this last stage, before giving a conclusion, students need to first verify the data that has been worked on to see the truth of the answers given. After being sure, only then do students give conclusions from the results that have been done. After all the discovery activities by students have been carried out, students communicate the results in class in front of

lecturers and peers to discuss the findings they get. These activities have a good impact on analytical skills, because each stage of discovery involves their thinking power, so that their abilities continue to be honed at each stage in solving problems to find answers (Pratiwi et al., 2020).

Third, namely giving time to make discoveries. Similar to the previous model, the researcher gave students a week to analyze the chosen topic. Sufficient duration gives students time to search, manage and analyze so as to produce discoveries that are in harmony with the chosen topic.

4. CONCLUSION

Based on the analysis of the results of the paired t-test with pretest and posttest scores, it shows that there is a significant positive influence of the use of the discovery learning model on the ability to analyze in students in the elementary social studies learning development course at STKIP Taman Siswa Bima. This is shown by a significant result smaller than 0.05, namely a sig value of 0.000. The implication is both theoretical and practical, namely the selection of the right learning model can affect students' ability to analyze. For example, the use of the discovery learning model improves students' analytical skills. One of the keys to the success of the learning model used in the learning process is the independence and motivation of learning found in students. Educators need to pay attention to the readiness of the material, as well as the readiness of the learners, both in terms of motivation and learning independence, aiming to optimize the process of implementing a learning model used. The advantage of this research is that it can contribute to the development of a more effective and innovative learning model, and can help improve the quality of education at STKIP Taman Siswa Bima by implementing a more effective learning model. The disadvantage of this study is that it depends on the research instrument used, so that the results of the research are influenced by the quality of the instrument, and have limited time, so the researcher may not be able to conduct more in-depth research. The next recommendation for researchers is to be able to compare this learning model with other learning models to find out which one is more influential in developing analytical skills in students.

REFERENCES

Al Aliyawinata, T. T., Utari, E., & Mahrawi, M. (2021). The effect of discovery learning on students' higher-order thinking skills. *International Journal of Biology Education Towards Sustainable Development*, *1*(1), 1–9.

Amin, S., Utaya, S., Bachri, S., Sumarmi, & Susilo, S. (2020). Effect of problem-based learning on critical thinking skills and environmental attitude. *Journal for the Education of Gifted Young Scientists*, *8*(2). https://doi.org/10.17478/jegys.650344

Anugraheni, I. (2020). Analisis Kesulitan Mahasiswa dalam Menumbuhkan Berpikir Kritis Melalui Pemecahan Masalah. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *4*(1), 261–267. https://doi.org/10.31004/cendekia.v4i1.197

Arikunto, S. (2010). *Prosedur Penelitian: Suatu Pendekatan Praktik* (Ed.Rev.cet). Jakarta: Jakarta : PT Rineka Cipta.

Aritonang, T. J. S., & Astuti, S. (2021). The Effectiveness of Discovery Learning and PBL Models on Student's Critical Thinking Skills. *Musamus Journal of Primary Education*, *3*(2), 157–165. https://doi.org/10.35724/musjpe.v3i2.3502

Astari, W., & Soro, S. (2022). Differences in Mathematical Communication Ability Using Discovery Learning and Conventional Learning Models. *Daya Matematis: Jurnal Inovasi Pendidikan Matematika*, *10*(2), 114. https://doi.org/10.26858/jdm.v10i2.34844

Chusni, M., Saputro, S., Budi Rahardjo, S., & Suranto. (2020). Student's Critical Thinking Skills Through Discovery Learning Model Using E-Learning on Environmental Change Subject Matter. *European Journal of Educational Research*, *10*(3), 1123–1135. https://doi.org/ISSN: 2165-8714

Elvadola, C., Lestari, Y. D., & Kurniasih, T. I. (2022). Penggunaan Model Pembelajaran Discovery

Learning dalam Meningkatan Hasil Belajar Siswa Sekolah Dasar. *Pedagogia: Jurnal Ilmiah Pendidikan Dasar Indonesia*, 4(1), 31–38. https://doi.org/10.52217/pedagogia.v4i1.732

Fajrin, N., Yusuf, M., Ikhlas, A., Oktiawati, U. Y., Prastawa, S., Sitopu, J. W., … Tamalanrea, K. (2024). Analisis Keberhasilan Implementasi Model Pembelajaran Discovery Learning dalam Pembelajaran Matematika Tingkat Perguruan Tinggi. *Journal on Education*, *07*(01), 239–252.

Firdaus & Aini, 2024. (2024). *Nusantara Educational Review Pengaruh Model Pembelajaran Discovery Didik Kelas V Materi Sistem Peredaran*. 2(1), 8–15.

Fitria, D., Bakhruddin, A., & Kudus, U. M. (2024). Pengaruh Permainan Rangking Satu berbantuan Powerpoint Interaktif terhadap Hasil Belajar IPAS di Kelas IV SD The Influence of the Rank One Game Assisted by Interactive Powerpoint on Science Learning Outcomes in Class IV Elementary School. *Jurnal Riset Madrasah Ibtidaiyah (JURMIA)*, *4*(2), 146–158.

Gunawan, D., Soekamto, H., Sahrina, A., & Suharto, Y. (2023). Pengaruh model discovery learning berbantuan video terhadap keterampilan berpikir kritis siswa. *Jurnal Integrasi Dan Harmoni Inovatif Ilmu-Ilmu Sosial*, *3*(6), 626–635. https://doi.org/10.17977/um063v3i6p626-635

Hergüner, G., Yaman, Ç., Sari, S. Ç., Yaman, M. S., & Dönmez, A. (2021). The Effect of Online Learning Attitudes of Sports Sciences Students on their Learning Readiness to Learn Online in the Era of the New Coronavirus Pandemic (Covid-19). *TOJET: The Turkish Online Journal of Educational Technology*, *20*(1), 68–77.

Hidajat, F. A., Haeruman, L. D., Wiraningsih, E. D., & Pambudi, D. S. (2023). The Effect of Digital Technology Learning Based on Guided Discovery and Self-regulated Learning Strategy on Mathematical Creativity. *International Journal of Information and Education Technology*, *13*(3), 535–543. https://doi.org/10.18178/ijiet.2023.13.3.1836

Ilhan, A., & Gülersoy, A. E. (2019). Discovery Learning Strategy in Geographical Education: A Sample of Lesson Design. *Review of International Geographical Education Online*, *9*(3), 523–541. https://doi.org/10.33403/rigeo.672975

Jamil, S. H., & Aprilisanda, I. D. (2020). Pengaruh Pembelajaran Daring Terhadap Minat Belajar Mahasiswa Pada Masa Pandemik Covid-19. *Behavioral Accounting Journal*, *3*(1), 37–46. https://doi.org/10.33005/baj.v3i1.57

Karatas, K., & Zeybek, G. (2020). The Role of the Academic Field in the Relationship between Self-Directed Learning and 21st Century Skills. *Bulletin of Education and Research*, *42*(2), 33–52.

Mahendra, F. F. N. (2020). Acitya : Journal of Teaching & Education. *Journal of Teaching and Education*, *2*(1), 71–81.

Mahrunnisya, D. (2023). Keterampilan Pembelajar Di Abad Ke-21. *JUPENJI : Jurnal Pendidikan Jompa Indonesia*, *2*(1), 101–109. https://doi.org/10.57218/jupenji.vol2.iss1.598

Margiani, F., & Pratiwi, I. (2023). The Effect of The Discovery Learning Model On Science Learning Outcomes In Class IV Style and Motion Material YPI Nur Fadhilah. *Education Journal of Elementary School*, *4*(1).

Meleong, L. J. (2011). *Metedologi Penelitian Kualitatif*. Bandung: Rosda Karya.

Nurhayati, N., & Angraeni, L. (2023). Analisis Kemampuan Berpikir Tingkat Tinggi Mahasiswa (Higher Order Thinking) dalam Menyelesaikan Soal Konsep Optika melalui Model Problem Based Learning. *Jurnal Penelitian & Pengembangan Pendidikan Fisika*, *3*(2), 119–126. https://doi.org/10.21009/1.03201

Nurhikmah, N., Pambudi, D. I., & Mustadi, A. (2022). The Effect of Online Learning Towards Learning Motivation of University Students on Social Student Course. *AL-ISHLAH: Jurnal Pendidikan*, *14*(3), 3865–3876. https://doi.org/10.35445/alishlah.v14i3.1074

Oktiana, P. K., & Gani, E. G. (2022). The Influence of Discovery Learning Method and Reading Interest on Explanatory Text Writing Skills. *AL-ISHLAH: Jurnal Pendidikan*, *14*(4), 7261–7268.

https://doi.org/10.35445/alishlah.v14i4.2204

Prasetyo, F., & Kristin, F. (2020). Pengaruh Model Pembelajaran Problem Based Learning dan Model Pembelajaran Discovery Learning terhadap Kemampuan Berpikir Kritis Siswa Kelas 5 SD. *DIDAKTIKA TAUHIDI: Jurnal Pendidikan Guru Sekolah Dasar*, *7*(1), 13. https://doi.org/10.30997/dt.v7i1.2645

Pratiwi, K. M., Sudiarta, I. G. P., & Suweken, G. (2020). *The Effect Of Guided Discovery Learning Model Assisted By Open-Ended Student Worksheets Towards Mathematical Problem Solving Ability Reviewed Of Student ' s Emotional Intelligence*. *2019*(IConMNS 2019), 1–10. https://doi.org/10.1088/1742-6596/1503/1/012014

Rahayu, I., Suwarna, A. I., Wahyudi, E., Asfahani, A., & Jamin, F. S. (2024). Pendidikan Lingkungan Hidup dengan Membentuk Kesadaran Lingkungan dan Tanggung Jawab Sosial di Kalangan Pelajar. *Global Education Journal*, *2*(2), 101–110.

Rezania, V., & Afandi, R. (2020). *Buku Ajar Mata Kuliah Pengambangan Pembelajaran IPS SD* (Ctakan Per; M. F. Amir, ed.). Sidoarjo: Umsida Press.

Rihayati, Utaminingsih, S., & Santoso. (2021). Improving Critical Thinking Ability Through Discovery Learning Model Based on Patiayam Site Ethnoscience. *Journal of Physics: Conference Series*, *1823*, 1–9. https://doi.org/10.1088/1742-6596/1823/1/012104

Shaw, A., Liu, O. L., Gu, L., Kardonova, E., Chirikov, I., Li, G., … Loyalka, P. (2020). Thinking critically about critical thinking: validating the Russian HEIghten® critical thinking assessment. *Studies in Higher Education*, *45*(9), 1933–1948. https://doi.org/10.1080/03075079.2019.1672640

Sugiarti, & Husain, H. (2021). An influence of the contextual-based discovery learning model on the academic honesty of high school students. *International Journal of Instruction*, *14*(3), 645–660. https://doi.org/10.29333/iji.2021.14338a

Syamsul, A., Basyaruddin, & Yuhdi, A. (2020). Integration of High Order Thinking Skills in Research Method Subject in University. *Britain International of Linguistics Arts and Education (BIoLAE) Journal*, *2*(1), 378–383. https://doi.org/10.33258/biolae.v2i1.207

Uslu, S. (2020). Critical Thinking Dispositions of Social Studies Teacher Candidates. *Asian Journal of Education and Training*, *6*(1), 72–79. https://doi.org/10.20448/journal.522.2020.61.72.79

Wiono, W. J., & Meriza, N. (2022). Environmental Issues-based Discovery Learning to Enhance Metacognitive Awareness and Students' Higher-Order Thinking Skills. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, *7*(1), 35–45. https://doi.org/10.24042/tadris.v7i1.10464

Yunus, M., Setyosari, P., Utaya, S., & Kuswandi, D. (2021). The influence of online project collaborative learning and achievement motivation on problem-solving ability. *European Journal of Educational Research*, *10*(2), 813–823. https://doi.org/10.12973/EU-JER.10.2.813