

## Research Article

### Difference Ability Think Critical Using Learning Models Discovery Learning with Problem-Based Learning

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#### ABSTRACT

The low ability to think critically students results Study students who don't meet the minimum completeness criteria. This matter is caused by insufficient selection of learning models so that students have difficulty in studying. Study this aims to know the difference in ability to think critically by using the Discovery Learning model and the Problem-based learning model (case study on basics of marketing subject for class X Marketing at SMKN 1 Jember). Study this uses all overpopulation class X PM. The sample is a selection process using a purposive sampling technique. The research methods used are quantitative with an experimental design. The technique used for collecting capability data is critical is a test. Research results show that data analysis using the Independent Sample t-test with a level significance of 0.05 results calculations obtained is  $0.000 < 0.05$  which means there is a significant influence. From the results, be concluded that there is a considerable difference in ability to think critically between class experiments using Problem-Based Learning and classroom learning models controlled using the Discovery Learning model.

**Keywords:** *Ability to Think Critically, Discovery Learning, Problem-Based Learning*

#### Introduction

Nation must be capable of adapting to the developments in science and technology that are occurring, one of them by preparing quality human resources. Source Power quality human beings can be grown through optimal education. As it progresses rapidly current developments in science and technology this, then need capable competence to answer the demands of the digitalization era. Assumed competency is important in the era of digitalization are 4C competencies, including Critical Thinking,

Creative Thinking, Collaboration, and Communication. This matter aligned with the opinion of Jannah and Atmojo (2022) that there is harmony between the era of Industrial Revolution 4.0 or education 21st century with the use of digital technology as well ability to learn 21st century or what is known as 4C competencies.

One of the implementations of the 4Cs, namely think critically. Application thinks critical moment study teaching is a very important thing in honing the ability of students to finish problems. That matter is supported by Syafitri

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et al (2021) think critically must developed to solve problems, as well as conclude from various possibilities in a way effective as well as more skilled in evaluation.

According to Ennis (2012) ability to think critically is the ability where focus to on what is being done as well as trust. There are various purposeful indicators for measuring the ability to think critically namely: explaining in a way simple, constructive skills basic, concluding, an explaining further, as well organize strategy and tactics. Indicators in the ability to think critically can Keep going sharpened with finishing something problem or studies case through the application of the Problem-Based Learning model.

Teaching and learning activities process in school students, not enough can solve given problem by educators and not yet used to convey his idea so they tend only wait to answer another friend. According to Nuryanti et al (2018), low ability to think critically because weak students analyze, are not yet used to conveying ideas and depend on other people. That matter causes the students not to have enough use to hone their ability to think critically, so a learning process is required with an interesting learning model as well as a pleasant to use grow ability to think critically.

According to Hidayat and Rindrayani (2023), an effective, innovative, active, and fun learning model is needed. For interesting students are so active and trying to maximize their potential it has in reach the objective as well as hone the ability to think critically student. A learning model that can applied to reach an objective Problem-based learning.

Problem-based learning makes it possible exists participate in active students in class and train their ability to think critically with the resolution process problem. This matter is supported by the opinion of Choi et al in Pasaribu et al (2020) who stated that the Problem-Based Learning model is capable of supporting students to increase their ability to think critically and finish problems as well as can make solutions grow to understand between theories as well as practice from A material lesson.

Problem-Based Learning applies studies and cases in activities his learning makes the ability to think critically student honed.

Problem-Based Learning is a focused learning model for a student to share various forms of problems contained within life, regardless matter the practice students finish problems encounter (Meilasari et al, 2020). The Problem-based learning model resulted in a student being role active as well as growing the ability to think critically. To increase the ability to think critically a learning model has been used by others, one of them is the Discover Learning model.

The Discovery Learning model directs students to get new information, as well as strengthens their ability to research and build the ability to think critically students (Hidayat and Rindrayanti, 2023). This model involves students during the discovery process or formation draft with a series of scientific processes that involve activity experiments, as well as more focus on the search process information for finishing problems so that can hone thinking critically student.

Research conducted by (Novia, 2018) shows that Problem-Based Learning can increase the ability to think critically participant educate. Research conducted by Pasaribu, et al (2020) also states that the Problem-based learning model can increase the results of study participant education. Apart from that, research conducted by Fauziah (2022) stated that Discovery learning is effective in increasing the ability to think critically student. Research conducted by Chairunnisa (2019) states that the Discovery Learning model is capable increase the ability to think critically and participants educate.

These two models namely the Problem-based learning model and the Discovery Learning model increase think critical students. Based on the description the so done study sees the different abilities taught to students by using Problem-based learning and Discovery Learning models. Based on the description, the urgency of the study is to choose the application of a suitable learning model participant students at SMKN 1 Jember who can increase their ability to think critically student. Based on research that has been done updates on research This lies in the application of two purposeful learning models choose one of the best models for applied to students so that can

increase the ability to think critically to the eyes Basics lesson Marketing. Research purposes is to compare the ability to think critically vocational school students with Problem-based learning and Discovery Learning models. Expected this model can increase critical student's eyes Basics lesson Marketing. Later one of these models can applied as an alternative in the learning model worthy of innovation used

to increase critical students so that impact positive results and learn the Basics of Marketing.

### Materials and Methods

Types of research use experiment everyone or Quasi-Experimental with use type nonequivalent control group design. This matter aims to know because consequences involving two groups

Table 1. Nonequivalent control group design

Class	Pretest	Treatment	Post-Test
Experiment	Px	√	Py
Control	Kx	X	Px

Information:

Px and Kx : *Pretest* Results class experiments and class control before applied treatment

Py and Ky : *Posttest* Results class experiments and class control after applied treatment

√ : Applied class Problem-Based Learning model treatment

X : Class that does not apply Problem-Based Learning model treatment

The subject study is class X PM 2, totaling 36 students as class experimental, and class X PM 3 totaling 36 students as class control. Collected data in a study uses tests, observation, interview methods as well as documentation. Before the instrument was used as research, trials were carried out moreover formerly for level proficiency students think critically with the use of essay questions to score data ability think critically. Researchers used technique data analysis using SPSS with Normality test and homogeneity test were carried out before a t-test (*independent sample t-test*) was carried out.

### Data analysis method

The purpose of using the homogeneity test is to prove homogeneous or no homogeneous something mark variance across group samples, as well as to know if the data is from two groups until I get it from a population with variant the same. Homogeneity test this is applied to measure the pretest score.

Hypothesis testing applied at the time test is there are differences between Problem-based learning and Discovery Learning models to ability think critically. Statistics parametrics used is the independent sample t-test.

### Results and Discussion

In research, these skills think critically to be measured using 5 questions shaped with descriptions by the indicator ability to think critically. Hypothesis testing using the t-test with normality test was carried out moreover formerly. Normality test results for the pre-test and post-test can show in the column Kolmogorov Smirnov who pointed out that mark significance on both classes have mark significance < 0.05%. Apart from that, the results of the validity test state that the whole item question is critically own mark r-count that more bigger compared with the mark r-table so that can said that the data is normally distributed throughout item question them in a way that is valid accordingly with condition taking decision validity and feasibility used.

To see the different abilities to think critically students with a learning model Problem-based learning with Discovery Learning the Independent Sample t-test was carried out, the results of the Independent Sample T-test can see in the t-test output in the table under:

Table 2. Uji Independent Sample T-test

Hasil Tes	t-test for equality of variances Sig (2-tailed)
Equal variances assumed	.000
Equal variances not assumed	.000

Independent Sample T-test results above show that from the table above, yes is known that the ability to think critically between the second class is such influence significant. The test result can see from the value (sig.2-tailed) is 0.000 ( $0.000 < 0.05$ ). Based on results the can be concluded that there are differences between Problem-based learning and discovery learning models towards the ability to think critically students, with classes that implement the Problem-based learning model as class experiments obtained results ability to think critically more compared to classes that implement the discovery learning model as class control. This matter to the results of research by Hidayat and Rindrayani (2023) that the learning model Problem-based learning is better compared to a learning model discovery learning in increases the ability to think critically student. So that Problem-based learning is

effectively used in activity study teaching so that ability of students to think critically increases.

Results data analysis results test the ability to think critically, showing that the average value class experiments that implement Problem-based learning models are bigger than class control with the Discovery Learning model. Calculation capability data analysis think critical student the results of the ability test were obtained think critical with implementing the Problem-based learning model and Discovery Learning model different enough significant, p based on the results of hypothesis testing. Research results in this obtained that the Problem-based learning model gives a good impact to ability think critically student. That matter showed with the participation of active students during the learning process.

Table 3. Pretest and Posttest Results

Indicator think critical	Class control		Class experiment	
	Pretest	Posttest	Pretest	Posttest
Explain By Simple	11.33	14.89	12.22	18.00
Build Skills base	10.44	14.89	10.22	17.67
Conclude	10.78	12.22	10.67	14.33
Explain carry on	11.67	13.33	11.00	15.44
Set strategy and tactics	11.44	14.78	11.78	16.11
Total	55.67	70.11	55.89	81.56

For see level of ability to think critically use material procedure security, safety, and health work (K3) by applying the Problem-based learning model and Discovery Learning model. In the K3 material, the Problem-Based Learning model is applied to get a mark amounting to 81.56 tall compared with the *discovery learning* model with results of 70.11. This model pushes students to more think critically, because there is a questioning process answer between groups as well and students become more spirit in finishing studies given case to her moment finish studies case. Difference ability to

think critically students be measured through experience learn differently. Researchers also observed that's it with implementing the learning model Problem-Based Learning during the learning process taking place will face various real-world situations, and they will become more learner-ready, excited, and engaged in a way direct. According to Arends in Jamil (2014), Problem-based learning is a learning model in which students do authentic problems with meaning to compile knowledge they own, develop inquiry and skills think more highly, develop independence, and trust self. Through

activity, the activities and thought processes of scientific students become more logical, orderly, and thorough which it easier to understand the draft. That matters because students will experience various types of related problems with activity every day. Opinion this in line as stated by Sarira (2019) Problem-based learning model is a capable model that supports students to be independent as well as more actively increase their ability to think critically and finish a problem by looking for data to obtain solutions to rational and authentic.

The learning process applies the Problem-based learning model moment its implementation is more focused on the completion problem. Usually, students participate and collaborate in A group to look for solutions will problems encountered. The role of educators in the Problem-based learning model as facilitators with give guidance at the start as well as support students in finishing studies cases. That thing in line with the statement of Prasetyo and Kristin (2020) In the Problem-based learning model, educators act as facilitators, not only applying source information the only one. Role educators here to give service so that students more easier moment activity studying in class, as well as encourage so Skills intellectual student increase for example with fertilize motivation students interested in the material lesson.

Meanwhile, in the discovery learning model is objective learning that lets students find concepts, and facts through exploration or experiment. In student K3 material expected can finish related problems with K3 procedures. Although the student is free to look for knowledge, will during the learning process with the discovery learning model needs a long time to learn and students many people choose to be silent because confused in finding drafting their knowledge alone. That matters to the statement of Mukaramah et al (2020) that one shortcoming of the Discovery Learning model that is students who have difficulty academically will experience obstacles thinking as well as in the express a connection between written concepts and verbal.

Researchers observe that it is in the learning process with the application of the Problem-based learning model, that educators give

various example problems or studies related cases with K3 material. Where are the student's given studies case then the student requested to analyze and solve studies cases that have been given. Meanwhile, the Discovery Learning model is more open and exploratory during the learning process. Students tend involved in determining the direction of learning alone.

The Problem-based learning model shows the mean difference is taller compared to the Discovery Learning model because students are more active during the learning process. Learning model Problem-based learning can make the students more active compared to learning models discovery learning matters because, in the Problem-based learning model, students more freely discuss without participation from the teacher so matters the impact to ability think critically students (Iskandar, 2020).

Participants educated in class Problem-Based Learning have the ability to think critically more superior compared to student class Discovery Learning. Although the second class can increase the ability to think critically, Problem-based learning its effectiveness tends more good moment increase the ability to think critically student. According to (Asmal, 2023), both models are more focused ability students implementing their ideas the moment overcome a problem. Problem-Based Learning as well as Discovery Learning have different influences on students. Discovery Learning invites students to get information new they don't know previously, develop research skills, improve motivation, and improve ability critical. Whereas Problem-Based Learning helps students think in a way critical, developing the ability to analyze circumstances as well as overcome problems using creativity.

## Conclusion

Based on results from research that has been implemented, testing analysis and testing hypothesis show that H0 is rejected and H1 is accepted which means there are differences between Problem-based learning and Discovery Learning models toward the ability to think critically students. Acquisition shows exist significant difference, where the class with the Problem-based learning model more superior

compared with the Discovery Learning model class.

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### References

- Arends, R, I (2013). Learning To Teach Learning to Teach. Ninth Edition. United States: The McGraw-Hill.
- Asmal, M. (2023). Comparison of Problem-Based Learning and Discovery Learning Models on Student Learning Outcomes. *Journal of Education*, 5(2), 5413-5420 <https://doi.org/10.31004/joe.v5i2.1287>
- Fauziah, Anas Sofiatul & Fahimul. (2022). The Influence of the Discovery Learning Model on Ability to Think Critical Students in Economics Subjects. *Journal Proceedings of Economic Education*. <https://prosid-ing.unipma.ac.id/index.php/PROSPEK/article/view/3132>
- Hidayat, T., & Rindrayani, SR (2023). Differences in Learning Methods Based Problems and Discovery Learning Against Ability Think Critical Students in Economics Subject XI IPS SMAN 1 Pakel. *Journal Study Multidisciplinary*, 1 (8) 764-770 <https://ejournal.45mataram.ac.id/index.php/armada/article/view/727>
- Iskandar, I., & Dini, M. (2020). Effectiveness Use of Discovery Learning, Inquiry, and Problem-Based Learning Methods to Increase the Ability to Think Critically. *Journal of Accounting and Finance Education*, 1(8) 764-770 <https://doi.org/10.17509/jpak.v8i1.20627>
- Jannah, DR, & Atmojo, IRW (2022). Digital Media in Empowering Ability Think 21st Century Critical Science Learning in Elementary Schools. *Journal Basicedu*, 6 (1)1064-1074. <https://doi.org/10.31004/basicedu.v6i1.2124>
- Meilasari, S., & U, Yelianti. (2020). Study of the Problem-Based Learning (PBL) Learning Model in School Learning. *Journal of Biology and Science Education*, 3 (2) 195-207 <https://doi.org/10.31539/bioedusains.v3i2.1849>
- Mukarramah, M., Rika, K., & Rismawati. (2020). Analyze Advantages and Disadvantages of the Discovery Learning Model Audiovisual Based in Indonesian Language Lessons. *Journal Scientific Education Students*. 1 (1) 1-9 <https://jim.bbg.ac.id/pendidikan/article/view/12>
- Nuryanti, L., Zubaidah, S., & Diantoro, M. (2018). Analysis Ability Think Critical Middle school students. *Journal of Education*. 3(2) 155-158. <http://dx.doi.org/10.17977/jptpp.v3i2.10490>
- Prasetyo, F., & F, Kristin. (2020). The Influence of the Problem-Based Learning Model and the Discovery Learning Model on Ability Think Critical Student 5th Elementary grades. *Journal of School Teacher Education Basics*, 7 (1) 13-27. <https://doi.org/10.30997/dt.v7i1.2645>
- Sarira, PM, Priyiyi, DF, & Astuti, SP (2019). Connection Argumentation Scientific from Learning Results Cognitive in the Application of the PBL Model. *Journal of Science and Mathematics Education*. 7(2) 1-10. <https://doi.org/10.23971/eds.v7i2.1258>