

Conference Paper

Improvement of Student Critical Thinking About Using Discussion Learning

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Abstract

This study purpose to find out whether there are differences in critical thinking of students using whole-group discussion learning with buzz-group discussion. The method used is a quasi-experimental method with two class groups, ie experimental class with whole-group discussion and control class with buzz-group discussion. The research design used is Nonequivalent Control Group Design. In analyzing the data, each individuals pretest score is subtracted from its posttest score, allowing gain analysis or change. The population in this study are all students of class XI SMK Daarut Tauhid Boarding School Bandung in the odd semester of the academic year 2017/2018. Based on the results of hypothesis testing, generate a statement that the hypothesis proposed by the researcher or alternative hypothesis (H₁) accepted and H₀ rejected. So that it becomes the basis for researchers to argue that critical thinking experimental class students are different from the critical thinking of control class students. This shows that whole-group discussion of learning can be an alternative in learning discussion if the number of students is equal to or less than 15 people. The whole-group discussion makes students more active in teaching and learning, especially when conducting discussions. Each student has a discussion and responsibility for each group, working together and exchanging answers, discussing inequalities in answering questions, and helping each other solve problems on the practice.

Keywords: critical thinking, discussion lessons, Whole-Group Discussion and Buzz-Group Discussion

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1. Introduction

In the learning process needs to be developed thinking skills which is a mental activity to gain knowledge. Based on the process, thinking can be grouped into basic thinking and complex thinking. The complex thinking process called high-level thinking includes four kinds, namely problem solving, decision making, critical thinking, and creative thinking (Costa in [21]). The pattern of learning today requires the activeness and creativity of students in processing data or information provided by teachers during the process of teaching and learning activities to occur pengonstruksian knowledge significantly. Therefore, it takes the ability to think [10].

The ability to think critically trains learners to make decisions from various points of view carefully, thoroughly, and logically. With the ability to think critically learners can consider the opinions of others and able to express their own opinions. Therefore, learning in schools should train students to explore skills and skills in searching, processing, and assessing critical information [17].

Critical thinking is indispensable in the process of teaching and learning in order to facilitate students to understand certain areas of science in more depth. Critical thinking is important, because it enables one to analyze, judge, explain and structure his thinking, thereby minimizing the risk of adopting wrong beliefs, or thinking and acting using the false beliefs (Surya in Agustin, 2012). The following data show the critical thinking skills of learners in Indonesia based on the results of TIMSS (Trends in Mathematics and Science Study).

TABLE 1: Teacher Participation in Professional Development in Mathematics.

Country	Percent of Students by Teachers' Area of Professional Development							
	Integrating Information Technology Mathematics		Critical Thinking or Problem Solving Skills		Mathematics Assessment		Individual Students' Needs	
Chinese Taipei	34	(3,4)	40	(3,7)	39	(4,0)	62	(3,3)
Hong Kong SAR	69	(4,0)	73	(4,6)	45	(4,7)	51	(4,7)
Indonesia	40	(3,4)	71	(2,8)	68	(3,1)	63	(3,3)
Iran, Islamic Rep	29	(3,5)	34	(3,6)	44	(3,8)	39	(3,5)
Korea, Rep. Of	16	(3,0)	42	(4,1)	33	(4,0)	38	(4,0)
Saudi Arabia	45	(3,4)	53	(4,1)	41	(4,4)	49	(4,1)
Singapore	59	(2,7)	58	(2,8)	62	(2,9)	43	(2,7)
Abu Dhabi, UAE	58	(4,2)	73	(3,5)	51	(4,0)	66	(4,0)
Dubai, UAE	61	(2,0)	73	(1,8)	66	(2,3)	67	(1,6)

Source: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Based on table 1, the level of critical thinking of students in Indonesia is still low. The impact will be felt if learners are not able to improve the ability of critical thinking in general, the government will not produce human resources who really have the skills to think critically and the ability to solve problems, besides the learning process of learners will be less asked and of course Such learning is not a student center [5]. The weak of students' critical and creative thinking can be caused by several factors, one of which is the learning process that is carried out. Learning should involve students actively and facilitate students to be able to use critical thinking skills. In addition, it has become an obligation for teachers to be able to design interactive, inspirational, fun, challenging, and motivating students to actively participate in accordance with Permendiknas No 41 of 2007 on Standard Process [14].

One of the problems facing Indonesian education today is the weak learning process which resulted in the low quality of education. This is due to the low ability of critical thinking of learners (Sutrisno, 2007). If we look at the lesson, students are less encouraged to develop their thinking ability. Learning is directed to memorize and hoard information, so the students are smart theoretically but poor application. As a result the ability to think critically become frozen, even become difficult to develop [2]. Basically students have the ability to think critically in learning such as questioning skills, hypothesis, classification, observation (observation) and interpretation [15]. The critical thinking skills of each individual vary, depending on the frequent exercises to develop critical thinking [7].

To solve learning problems, efforts should be made, among others, in the form of improved learning strategies that are changing the method of learning that can facilitate the communication between students and students and teachers, so as to foster students' thinking skill [1]. Methods have a very large share in teaching and learning activities. That means learning objectives will be achieved with proper use. Teachers must be able to choose and determine the appropriate teaching methods so as to enhance student activeness and students' critical thinking [6].

One of the factors that determine the quality of learning is the selection of learning methods in order to design learning. Selection of learning methods should receive careful attention to create effective management of teaching and learning processes so as to attract interest in one's personal learning and will stimulate the desire for greater learning [13]. Teachers need to design learning that can generate potential students in using their thinking ability to solve problems [11].

Discussion method is one of solution to improve student's critical thinking ability [16]. Discussion methods can be used as a way to strengthen student mastery of

the subject matter. It can also train the students' habits to be able to think critically and objectively, to develop initiative and creativity as well as the responsibilities of students on the mastery and application of the knowledge gained through the lessons it receives and to enable the students to learn something with their group [16].

This research tries to reveal the difference of critical thinking of students using learning of class discussion with group discussion study.

2. Literature Review

The concept of critical thinking has become an important discussion in the modern era now, but it turns out this concept has been discussed since 2400 years ago by Socrates in a question and answer activities that can also be interpreted learning, the activity is then recorded by Plato so it can be discussed in the modern era now [12]. Critical thinking builds on the theory of cognitive thinking in psychological aspects and then develops so as to elicit constructivist aspects which must lead to a rational and systematic process of active and rational thinking. Thinking in psychology becomes the axiological aspect of philosophy. Psychologically based critical thinking theory is excluded and built from the cognitive dimension [9]. Critical thinking is an "active process" and "regular or systematic way of thinking" to understand information in depth, thus forming a belief in the truth of information obtained or opinions conveyed. Implicitly, critical thinkers evaluate the implicit thoughts of what they hear and read, and examine the process of self-thinking when writing, solving problems, making decisions, or developing a project [3]. The consequence is the demands of teachers to be able to develop students' critical thinking skills in learning [8].

Critical thinking is the process of analyzing or evaluating the information of a problem based on logical thinking to determine the decision [22]. Critical thinking is an intellectual process of conceptualising, applying, analyzing, synthesizing, and / or evaluating various information derived from observations, experiences, reflections, in which the outcome of this process is used as a basis when taking action [20]. The ability to think critically is the thinking ability of learners to compare two or more information with the aim of acquiring knowledge through testing of distorted symptoms and scientific truth [18].

According to Ennis (Costa, 1998) the indicators of critical thinking skills are divided into 5 groups: (1) providing elementary clarification, (2) building basic skills, (3) making inferring,) make further clarification, (5) organize strategies and tactics. According to Desmita (2009: 158) in [15] some characteristics are needed in critical thinking or

making considerations, namely: (1) the ability to draw conclusions from observations; (2) the ability to identify assumptions; (3) the ability to think deductively, (4) the ability to make logical interpretations, and (5) the ability to evaluate which arguments are weak and strong.

Discussion methods are activities undertaken by learners to exchange information, opinions, and experience elements on a regular basis. The aim of exchange is to gain a clearer and more conscientious understanding of what is being discussed, and to prepare for and resolve common decisions [19]. The steps of Discussion Method according to Djamarah (2013: 12) are: (1) preparation (condition of student, giving information or explanation about task problem in discussion, preparing participant, time, place, facility and infrastructure), (2) conducting discussions, teachers stimulate all participants to participate in discussions, giving opportunity to all members to play an active role, noting responses or suggestions and important ideas), (3) evaluation (giving assignments to make discussion conclusions, assessing the outcome of the discussion).

According to Roestiyah (2008), the discussion is divided into: (1) Whole-group, a discussion where group members perform no more than 15 people, (2) Buzz-group, one large group divided into 2-8 smaller groups if this small group is required to report what the results of the discussion are to a large group, (3) panels, a small group (between 3-6 people) discuss a particular subject, they sit in a semi-circular arrangement faced by one large group of other participants. Members of this large group can be invited to participate.

This study attempts to apply discussion lessons by applying whole-group discussions in the experimental class and buzz-group discussion in the control class. The difference of group discussion and class discussion lies in determining the number of groups only, in the group discussion divided into 4-6 students in one discussion group, while in the class discussion the total number of students is made into one discussion group.

Based on the theoretical basis of the variables studied in this study, the hypothesis formulated for later tested is that there are differences in critical thinking of students using whole-group discussion of learning with buzz-group discussion.

3. Research Methods

The research method used is quasi experiment. The study was divided into two groups of students, the experimental class group with the whole-group discussion and control group with buzz-group discussion. The research design used is Nonequivalent Control

Group Design. In analyzing the data, each individual’s pretest score is subtracted from its posttest score, allowing gain analysis or change. The design is preceded by pretest and then treated then done posttest. The sampling technique used purposive sampling technique. The experimental class that is the students of class XI AK-A and the control class are the students of class XI AK-B SMK Daarut Tauhid Boarding School Bandung in the academic year 2017/2018 even semester. The reason for choosing grade XI students is assuming already have enough knowledge, ready to solve the problems that demand critical thinking ability, not too disturbed by academic activities such as preparation and implementation of national examination.

The data collection uses a written test of objective thinking skills that are objective based on Ennis’s theory in (Costa, 1998) on the indicators of critical thinking ability as follows:

TABLE 2: Variabel Operational.

Dimension	Indicator
1. Elementary Clarification	<ul style="list-style-type: none"> •Differntiate by focusing answers •Analyze argument
2. Basic Support	<ul style="list-style-type: none"> •Consider the credibility of a source •Observing and considering observation
3. Inference	<ul style="list-style-type: none"> •Make deductions and consider the results of deduction •Make inductions and consider induced results
4. Advance Clasification	<ul style="list-style-type: none"> •Identify terms and consider definition •Identify assumptions
5. Strategies and tactics	<ul style="list-style-type: none"> •Decide an action •Interact with others

The test is held in the form of pretest and posttest. Problem given is a matter of Financial Accounting class XI subjects on basic competencies apply inventory method (FIFO, LIFO, Average, Special Identification).

After collecting research data, briefly can be explained data processing technique that is (1) calculate each test answer of learner based on correct learner answer, (2) calculate raw score from each pretest and posttest answer, (3) calculate normalization of gain between value average pretest and overall posttest average, (4) perform normality test, (5) perform homogeneity test, (6) hypothesis test of research.

4. Research Result

Based on the result of validity test, it is known that all items in this research are valid, because t-table is bigger than t-count > 0,468 by using significant level $\alpha = 0,05$. To

calculate the reliability of the test equipment using the Spearman Brown formula, the reliability value obtained from the calculation result is 0.843. The next step the researcher performs the normality test where the variable X and Y variable show the significance value 200^* .

The item analysis includes the differentiator and problem level, as for the result of (1) the differentiating power of the problem known that one item of matter is categorized sufficiently and four questions are categorized well. (2) problem level, from five items of problem, four items categorized medium difficulty level and one easy question. Before performing the hypothesis test, normality test was performed using Shapiro-wilk test with significance level of 5%. The result of analysis shows that the significance value of the experimental class and control class at pretest and posttest shows that the data is normally distributed (significance level greater than 0.05). Homogeneity test was performed by Levene's test statistic with significance level of 5%. From the analysis results can be seen that the test results in both classes at the time of pretest and at the time of posttest is normal distribution ($p < 0.05$).

4.1. Differences in critical thinking skills before and after treatment

In this study, analysis of research results conducted on pretest and posttest results obtained at the time of the study. Here is the result:

4.1.1. Experimental class

Before treatment is applied, students have an average learning result value of 53.11. After treatment, student learning outcomes increased to 85.81. Gain is 32.7. This shows an increase in the average value of student learning outcomes in the experimental class.

4.1.2. Control class

Before the treatment is applied, students have an average learning result score of 52.43. After treatment, student learning outcomes increased to 72.43. Gain is 20.0. This shows an increase in the average value of student learning outcomes in the control class.

4.2. Differences in gain values in the experimental and control class

From the descriptive data of the experimental class and control class showed that there was an increase in posttest time. Posttest in the experimental class is obtained with an average value of 85.81, whereas in the control class is obtained posttest with an average of 72.43. Based on these data shows that whole-group discussion learning can improve students' critical thinking higher than buzz-group discussion lesson.

If a posttest result graphic in the experiment class and the control class will show the following results:

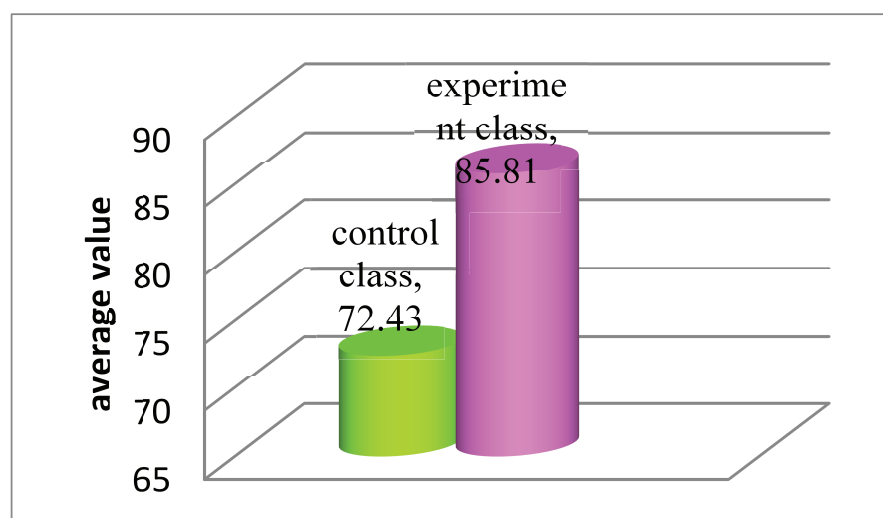


Figure 1: Average Comparison of Posttest Grade Experiment and Control Class.

From the graph shows that the average posttest value in the experimental class is higher than the average value in the control class. The average comparison of values between the experimental and control classes is 13.38.

4.3. Hypothesis testing

From the calculation, the experimental class hypothesis is obtained that students' learning outcomes during pretest and posttest are different. It can be seen in the result obtained that is t_{count} of 7,619 with significance 0,000 where α 5%. Because t_{hitung} (7,619) > t_{table} (2,101) then $H_1: \mu_1 \neq \mu_2$ is accepted and $H_0: \mu_1 = \mu_2$ is rejected. So it can be concluded that there is a difference in the improvement of learning outcomes of the experimental class students between before being treated at pretest with after being treated at posttest. In testing hypothesis shows the existence of differences in students

critical thinking caused by the treatment in the experimental class. These differences indicate an increase in students critical thinking caused by discussion lessons.

5. Discussion

Based on the results of the research obtained from the average posttest 85.81 for the experimental class and 72.43 for the control class, it showed that the improvement of the students' learning outcomes in the experimental class using whole-group discussion is better than the control class using learning buzz-group discussion, this is in accordance with opinion [4] Rather than look at small group and whole class discussions in different courses or singles courses (as in a case study), we measured differences in the same learners grouped in whole class and small groups. The results of this study support some claims that small group activities afford such benefits as increased student participation, peer interactions and the development of socially constructed knowledge. This shows that whole-group discussion of learning can be an alternative in learning discussion if the number of students is equal to or less than 15 people.

Based on the results of hypothesis testing, generate a statement that the hypothesis proposed by the researcher or alternative hypothesis (H₁) accepted and H₀ rejected. So that it becomes the basis for researchers to argue that critical thinking experimental class students are different from the critical thinking of control class students. The acceptance of the hypothesis shows that there is an increase in critical thinking of students by using whole-group discussion.

In testing the hypothesis obtained $t_{count} (7,619) > t_{table} (2,101)$ showed the difference of students' critical thinking caused by the treatment in the experimental class. This difference indicates an increase in students' critical thinking caused by whole-group discussion. The results of this study are in accordance with the opinions expressed by [19] that the intervention using the discussion method has a positive and significant impact on the critical thinking of learners.

Learning with the whole-group discussion emphasizes the provision of wider student learning opportunities and a conducive atmosphere in gaining and developing knowledge, attitudes, values, and social skills. This enables students to be more active when discussing, having individual responsibilities within their group, can cooperate and exchange answers, discuss inequalities in answering questions, and help each other solve problems on the practice of the teacher. Any group that has understood

the material can teach members of the group who have not understood the material they are studying.

6. Conclusion

Based on the results of the research that has been presented in the previous chapter, can be drawn conclusion as follows:

1. Based on the results of data analysis shows that the results of student learning in the subjects of financial accounting class experiments after being treated whole-group discussion of learning is higher than the control class with the treatment of buzz-group discussion. The hypothesis formulated that "there is a difference of critical thinking of students using learning class discussion with group discussion learning" is acceptable, it is proved by hypothesis test with difference test average on two-party test. The application of whole-group discussion is positively influential, it can be seen from the improvement of the students' critical thinking after getting treatment.
2. Whole-group discussion proved to improve students' critical thinking. In this study showed differences in learning outcomes of 85.81 for the experimental class and 72.43 for the control class. This is evidenced by the value of different test results (t), from the above calculation t obtained = 7.619 while t_{table} = 2.101. So when inserted on the hypothesis formula $t_{count} > t_{table}$, so H_0 is rejected and H_1 accepted. In learning buzz-group discussion students are divided into one group in one class as a whole, so that each student is able to work with one another.

References

- [1] Almujaab, S. (2015). Pengaruh Metode Discovery Terhadap Peningkatan Berpikir Kreatif (Studi Kuasi Eksperimen Mata Pelajaran Kewirausahaan Pada Siswa kelas XI PS SMKN 1 Bandung).
- [2] Ariyati, E. (2010). Pelajaran Berbasis Praktikum (Eka A) 1, 1–12.
- [3] Astuti Wahyuni, Gardjito, B. H. (2014). ANALISIS KEMAMPUAN BERPIKIR KRITIS SISWA DALAM AKTIVITAS BELAJAR BIOLOGI DI KELAS XI IPA SMA NEGERI 11 KOTA Borneo, (September), 10–17.
- [4] Bliss, C. A. (2009). Is the Whole Greater Than the Sum of Its Parts? A Comparison of Small Group and Whole Class Discussion Board Activity in Online Courses. Journal

- of Asynchronous Learning Networks, 13(4), 25-40.
- [5] Edora. (2014). PENGARUH METODE PEMBELAJARAN PROBLEM BASED LEARNING TERHADAP PENINGKATAN KEMAMPUAN BERPIKIR KRITIS PESERTA DIDIK.
- [6] Efendi, U. H. (2012). Pengaruh Penerapan Metode Diskusi terhadap Kemampuan Berpikir Kritis Siswa pada Mata Pelajaran Sosiologi.
- [7] Fakhriyah, F. (2014). Penerapan Problem based Learning Dalam Upaya Mengembangkan Kemampuan Berpikir Kritis Mahasiswa. *Jurnal Pendidikan IPA Indonesia*, 3(1), 95-101. <https://doi.org/10.15294/jpii.v4i2.4179>
- [8] Farida Ardiyanti, W. (2014). PENGARUH MODEL PEMBELAJARAN BERBASIS FENOMENA UNTUK MENINGKATKAN KETERAMPILAN BERPIKIR KRITIS SISWA SEKOLAH DASAR, IX(November), 27-33.
- [9] Haviz, M. (2009). BERPIKIR DALAM PENDIDIKAN: (Suatu Tinjauan Filsafat Tentang Pendidikan Untuk Berpikir Kritis). *Jurnal Ta'dib*, 12, 81-91.
- [10] Kusumaningtyas, A., Zubaidah, S., & Indriwati, S. E. (2013). Pengaruh Problem Based Learning dipadu Strategi Numbered Heads Together terhadap Kemampuan Metakognitif, Berpikir Kritis, dan Kognitif Biologi Siswa Kelas XI SMA Negeri 5 Malang.(TESIS). DISERTASI Dan TESIS Program Pascasarjana UM, 33-47. Retrieved from <http://jpk.lemlit.um.ac.id/wp-content/uploads/2014/08/02-Anyta-Kusumaningtyas-OK.pdf>
- [11] Lidinillah, & Dindin. (2009). Pembelajaran Berbasis Masalah (Problem Based Learning).
- [12] Maxwel. (2014). Introduction to the Socratic Method and its Effect on Critical Thinking, 12-45.
- [13] Muldayanti, N. D. (2013). PEMBELAJARAN BIOLOGI MODEL STAD DAN TGT DITINJAU DARI KEINGINTAHUAN DAN MINAT BELAJAR SISWA. *JPII*, 1(1), 12-17. <https://doi.org/10.15294/jpii.v4i2.4179>
- [14] Nurina Happy, D. B. W. (2014). KEEFEKTIFAN PBL DITINJAU DARI KEMAMPUAN BERPIKIR KRITIS DAN KREATIF MATEMATIS, SERTA SELF-ESTEEM SISWA SMP, 1(November), 176-187.
- [15] Patmawati, H. (2011). ANALISIS KETERAMPILAN BERPIKIR KRITIS SISWA PADA PEMBELAJARAN LARUTAN ELEKTROLIT DAN NONELEKTROLIT DENGAN METODE PRAKTIKUM.
- [16] Rohani. (2016). Meningkatkan Kemampuan Berpikir Kritis Mahasiswa Melalui Metode Diskusi Bervariasi. *Ucej: Untirta Civic Educational Journal*, 1(2), 112-222.
- [17] Sari, D. D. (2012). Penereapan Model Problem Based Learning (PBL) Untuk Meningkatkan Kemampuan Berpikir Kritis Peserta Didik pada Pembelajaran IPA

Kelas VIII SMP Negeri 5 SLEMAN. Retrieved from <http://eprints.uny.ac.id/9174/10/10BABI-V.pdf>

- [18] Setyowati. (2011). Implementasi Pendekatan Konflik Dalam Pembelajaran Fisika Untuk Menumbuhkan Kemampuan Berpikir Kritis Siswa SMP Kelas VIII. *Pendidikan Fisika Indonesia*, 12(7), 89–96. <https://doi.org/10.1016/j.teln.2016.09.005>
- [19] Vita, D., & Pd, S. M. (2017). PENGARUH PENERAPAN METODE DISKUSI TERHADAP KEMAMPUAN BERPIKIR KRITIS PESERTA DIDIK PADA MATA PELAJARAN PENDIDIKAN PANCASILA DAN KEWARGANEGARAAN DI MADRASAH TSANAWIYAH NEGERI KARANGMOJO. *Jurnal Pendidika Kewarganegaraan*, 512–521.
- [20] Walker, Paul & Finney, N. (1999). *Skill Development and Critical Thinking in Higher Education*. Higher Education Research & Development Unit, University College, London WC1E 6BT, UK, 353–369.
- [21] Wiyono, K., Pd, S., Setiawan, A., Si, M., Suhandi, A., & Si, M. (2009). “ MODEL PEMBELAJARAN MULTIMEDIA INTERAKTIF RELATIVITAS KHUSUS UNTUK MENINGKATKAN KETERAMPILAN BERPIKIR KRITIS SISWA SMA ” MAKALAH SEMINAR NASIONAL PENDIDIKAN DI FKIP UNIVERSITAS SRIWIJAYA Palembang , 14 Mei 2009 Oleh:, 1–12.
- [22] Yanti Rakhmawati, Muh. Chamdani, K. C. S. (2013). PENERAPAN MODEL PBL (PROBLEM BASED LEARNING) DALAM PENINGKATAN BERPIKIR KRITIS IPA SISWA KELAS V SD. *Universitas Sebelas Maret*, (August), 1–7. <https://doi.org/Diakses> 17 Januari 2015