
THE CRITICAL THINKING SKILLS OF LOW ACADEMIC ABILITY STUDENTS OF SENIOR HIGH SCHOOL IN TERNATE, INDONESIA UNDERGOING RQA, STAD, AND RQA + STAD LEARNING

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ABSTRACT

Academic ability is one of the factors having an effect on students' learning success, so that low academic ability students require more attention than high academic ability students. The learning success of the low academic ability students which is demonstrated by the quality of students' critical thinking skills can be optimally achieved if the teachers implement appropriate learning models. This research aimed at revealing the critical thinking skills of low academic ability students undergoing RQA, STAD and the combination between RQA and STAD learning strategies. The subjects of this research were class X students of AL-Khairaat Senior High School and Muhammadiyah Senior High School Ternate. The results of this research show that there is a difference in the students' critical thinking skills in all the three learning strategies. Furthermore, the results of post hoc test showed that STAD combined with RQA learning strategy has the highest potential in empowering students' critical thinking skill and the potential is significantly different from the potential of RT and STAD. The critical thinking skill of students in the RQA combined with STAD learning strategy is 8.91% higher than that of the students in the RQA learning strategy and 25.95% higher than that of the students in the STAD learning strategy. Thus, it is expected that the RQA combined with STAD learning strategy be implemented consistently in the learning process in schools, so that the critical thinking skills of low academic ability students can be equal to the critical thinking skills of high academic ability students.

Keywords: Critical Thinking Skills, low academic ability student, RQA, STAD

1. INTRODUCTION

Academic ability is one of the factors affecting the students' learning success. It has been explained that based on their academic ability, the students could be divided into high, medium, and low academic ability students [1]. The same learning experience for all students might lead to the unequal learning achievement because, compared to the high academic ability students, the low academic ability students require longer time to learn and to understand the subject matter. Thus, it cannot be denied that the low academic ability students require greater attention than the high academic ability students do.

Distribution of education equality will happen if teachers are actively involved in their duties to create a learning process that is able to help students for developing their potential, especially the low academic ability students. As the spearhead of the education process, teachers have a variety of strategic roles, one of which is as a facilitator. Related to that role, the teacher is responsible for helping the students' learning process well, being patient, respectful and humble, being equal with the students, being close to the students, not trying to lecture, authoritative, impartial and not criticizing, being open and having positive attitude.

The purpose of education can be achieved optimally if the teacher facilitates the improvement of students skills, one of which is the students' critical thinking skill. As an indicator of the achievement of educational goals, these skills can make students skillful in managing their learning process autonomously as well as increasing their thinking skills [2; 3; 4; 5; 6]. Therefore, to empower students' critical thinking skills, teachers need the proper steps, one of which is by implementing the appropriate learning strategies. The learning strategies that have been proven to be able to empower students' critical thinking skills for example are Reading Questioning and Answering (RQA), Student Team Achievement (STAD) and RQA combined with STAD learning strategies.

Reading Questioning and Answering (RQA) strategy is a strategy that is based on the constructivism theory in which the implementation will be able to encourage the students to read the assigned learning materials, so that the learning can be implemented properly [7]. STAD Strategy is the simplest cooperative learning strategies, based on experience or group discussion in which the stages consist stating the learning objectives and motivating the students, presenting the information, organizing students in study groups, mentoring groups to work and learn, quizing and rewarding [8]. While the RQA combined with STAD strategy is a strategy generated through the combination between the syntax of RQA and STAD respectively.

The previous research revealed that RQA learning strategy was able to empower students' critical thinking skills [9; 10; 11]. Their research findings show that the improvement of the

skills can occur because the students are encouraged to read the material to be studied before, resulting in the expansion of students' cognitive processes. Furthermore, another previous researches reveal the ad too potential of STAD strategy in empowering students' critical thinking skills [12; 13; 8; 14; 15; 16; 17]. The potential is related to the implementation of STAD stages that allow the students to work together, talk to each other, communicate, and share their thoughts.

Unlike the potential of RQA and STAD learning strategies in empowering the students' critical thinking skill which has been revealed by many researches, the potential of RQA combined with STAD learning strategy in empowering students' critical thinking skills has not been revealed yet. In addition, the study on the previous researches shows that there has not been yet any research investigating the effect of RQA learning strategy, STAD learning strategy, and the combination of both strategies on the critical thinking skill of low academic ability students. Thus, it is necessary to conduct a research which aims at revealing the effect of those learning strategies on the critical thinking skill of low academic ability students.

2. RESEARCH METHOD

This is a quasi experimental research using pretest-posttest Nonequivalent control group design. The research design can be seen in Table 1.

Table 1. The experimental Design using pretest-posttest nonequivalent Control Group Design

Pretest	Treatment group	Posttest
O1	A2P1	O2
O3	A2P2	O4
O5	A2P3	O6

Information:

O1, O3, O5, O7 = pretest scores

O2, O4, O6, O8 = posttest scores

A2P1 = low academic ability groups using RQA learning

A2P2 = low academic ability group using STAD learning

A2P3 = low academic ability group using the combination between RQA and STAD learning

(Source: Tuckman, 1978)

The population of this research is all students of class X of non State Senior High Schools in Ternate. The samples in this research are class X students of AL-Khairaat Senior High school and Muhammadiyah Senior High School of Ternate city. The samples are selected by using simple random sampling technique. From the two schools, several classes were determined to be

used in this research, based on the results of the equality test. Three selected classes were used as the experimental classes.

The instrument used to measure the critical thinking skill is an essay test which is scored using a critical thinking skill rubric [18] . The data are obtained by giving tests before and after the treatment. The obtained data are tested for the normality and the homogeneity (prerequisite test), and then analyzed by using analysis of covariance (Ancova). If the results of the analysis show a significant result, an LSD test is performed further.

3. RESULT

The results of the prerequisite tests show that the data of the pretest and posttest were normally and homogeneously distributed. The results of the Covariance Analysis and post hoc test Least Significant Difference (LSD) related are shown in Table 2 and Table 3.

Table 2. The Results of the Ancova on the critical Thinking Skills of low academic Ability Students

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3156,353a	3	1052,118	12,409	,000
Intercept	29011,125	1	29011,125	342,175	,000
XCritical	32,561	1	32,561	,384	,537
Strategy	3140,156	2	1570,078	18,518	,000
Error	6019,689	71	84,784		
Total	367114,063	75			
Corrected Total	9176,042	74			

a. R Squared = ,344 (Adjusted R Squared = ,316)

Table 3. Summary of LSD Test on the critical Thinking Skills of low academic Ability Students

No	Strategy	XCritical	YCritical	Differences	CriticalCor	Notasi LSD
1	RQA+STAD	37,650	76,400	38,750	76,416	a
2	RQA	37,600	70,150	32,550	70,163	b
3	STAD	36,900	60,700	23,800	60,670	c

The results of the analysis of covariance on the critical thinking skills among the students who learned by using RQA, RQA combined with STAD, and STAD learning strategies as described

in Table 2 show that there is a difference in the critical thinking skills among the students in the three learning strategies.

The summary of the LSD test Table 3 shows that the effect of RQA combined with STAD has the highest score of critical thinking skills as much as 76.416. The score of critical thinking skills at RQA strategy is 70.163, higher than that of STAD, having the lowest score, that is, 60.670. It shows that the score of the students critical thinking skills at RQA combined with STAD is 8.91% higher than that of at RQA strategy, and 25.95% higher than that of at STAD strategy. Thus, the combination between RQA and STAD learning strategy can help empower the critical thinking skills of the low academic ability students more successfully compared to RQA learning strategy as well as STAD learning strategy.

4. RESULTS

The results of the covariance analysis related to the critical thinking skills among the students who have learned by using RQA learning, RQA combined with STAD learning, and STAD learning show that there is a difference in the critical thinking skill among the low academic ability students in all the three learning strategies. Furthermore, the results of the LSD test show that the critical thinking skills of the students who have learned by using RQA combined with STAD learning strategy has the highest score that significantly different from the critical thinking skills of the students who have learned by using RQA learning strategy. On the other hand the critical thinking skill of the students who have learned by using STAD has the lowest score that significantly different from the critical thinking skill of the students in the other two learning strategies.

The high potential of the combination of RQA and STAD learning strategy shows that the stages of the learning strategy are able to encourage the low academic ability students to empower their critical thinking skills. In the implementation of RQA combined with STAD learning strategy, the stages combined are the stages of RQA consisting of reading, questioning and answering with the stages of STAD consisting of stating the objectives and motivating the students, presenting information, organizing the students into learning groups, guiding the students to work and learn, quiz, and rewards. The combination of the stages makes the low academic ability students get big opportunity and sufficient time to improve their critical thinking skills. This is in line with the opinion stating that with the provision of sufficient learning time, the low academic ability students will be able to master the subject matter, so that their academic achievement will also increase [14].

The higher potential of RQA combined with STAD learning strategy compared to that of RQA or STAD separately also shows that the potential of each stage can be improved and the

combination can reduce the weaknesses of each strategy. It has been explained that the stages of RQA learning strategy had the potential to increase the expansion of students' thinking because the students were encouraged to read and understand individually the contents of the reading, so that they could find the main ideas of the readings [7; 10]. Furthermore, when they already found the main ideas, the students could create questions that represent the content of the reading and answer the questions, and then the students exchanged information and presented it to the class. Furthermore it has been explained too that through STAD, students were encouraged to improve their ability in group work and to share ideas to solve problems, so that they were able to master the subject matter [19].

The high potential of the combination between RQA and STAD learning strategy can also be explained by reviewing some previous research that revealed the potential of the habit of making questions. There were also references suggesting that questioning was a tool used to enhance students' thinking skills, and could be achieved through the teacher stimulation by providing questions [20; 21]. Furthermore it has been said too that questioning was one of the cornerstones of contextual learning [22]. Questioning can be used by students actively and critically to dig up information, solve ideas or ideas they previously have, so that their critical thinking skills can be improved. This is consistent with the opinion stating who stated that students who were encouraged to make questions and answer questions based on the information that they knew would be more motivated to be actively involved in the learning activities [23].

The fact that has been successfully revealed in this research can then be used as a basis to disprove the assumption that has developed in society and also in the world of education stating that low academic ability students will always achieve low learning results. Because through the implementation of active learning stage, the low academic ability students have more opportunities to improve their learning quality, and they can support and help each other in mastering the subject matter. Students are also encouraged to analyze problems they encounter, plan and implement the steps to resolve problems, and evaluate the steps of the problem solving actions [24; 25; 26; 27].

The results of the previous research on the effect of RQA combined with STAD learning strategy on low academic ability students have not been widely reported. However, the related research, such as the one conducted before has explained that the learning developed based on the RQA strategy is proven to have potential to improve students' critical thinking skills because the implementation stages of reading (reading), make substantial inquiries (questioning), and answering questions (answering) may enable the occurrence of meaningful learning where these conditions can apply to all students, especially the low academic ability students [11]. This is in line with the reports previously arguing that the implementation of RQA learning model could

enhance students' critical thinking skills, particularly the low academic ability students [9; 28; 29].

The high potential of RQA combined with STAD learning in improving the critical thinking skills of low academic ability students indicates that this learning model can be consistently implemented in the learning process in schools. Through the implementation of the learning strategy, it is expected that the critical thinking skill of low academic ability students can be aligned with the critical thinking skill of high academic ability students.

5. CONCLUSION AND SUGGESTIONS

5.1 Conclusion

There is a difference in the critical thinking skills of low academic ability students who learned by using RQA learning, STAD learning, and RQA combined with STAD learning. Among the students in the three learning strategies, the students in the RQA combined with STAD learning strategy have the highest critical thinking skill. The critical thinking skill is 8.91% higher than that of the students in the RQA learning strategy and 25.95% higher than that of the students in STAD.

5.2 Suggestions

- Based on at the high potential of RQA combined with STAD learning strategy to empower students' critical thinking skills, it is expected that this strategy can be consistently implemented in biology learning in low academic ability class, so that the quality of the learning can be improved.
- In the implementation of RQA combined with STAD learning strategy, teachers are expected to have the ability and competence to organize the learning which combines the syntaxes of RQA and STAD. With teachers' good capabilities and competence, the learning will be able to accommodate an increase in students' critical thinking skills optimally, especially those having low academic ability.

REFERENCES

- [1] Nasution. *Berbagai Pendekatan Dalam Proses Belajar Mengajar (Various Approach in Teaching and Learning Process)*. Jakarta: Bumi Aksara, 2006.
- [2] Livingston, J.A. *Metacognition: An Overview*. 1997. (Online). (<http://gse.buffalo.edu/fas/shuell/cep564/metacog.htm> accessed on June 21, 2015)

- [3] Hennessey, M. G. *Probing the Dimensions of Metacognition: Implications for conceptual Change Teaching-Learning*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Boston, MA, March 28-31, 1999.
- [4] Hollingwoth. R.W & C. McLoughlin. Developing Science Students metacognitive Problem Solving Skills, online. The University of New England. *Australian Journal of Educational Technology*, vol 17, no. (1), pp. 50-63, 2001.
- [5] Dawson,T.L. *Metacognition and Learning in Adulthood*. 2008. (Online), (<https://dts.lectica.org/PDF/Metacognition.pdf> accessed on July 5, 2015)
- [6] Lee, S. *Examining the Relationships between Metacognition, Self Regulation and critical Thinking in Online Socratic Seminars for High School social Studies Students*. Dissertation. Austin : The University of Texas, 2009.
- [7] Corebima, A.D. *Pengalaman Berupaya Menjadi Guru Profesional. Pidato Pengukuhan Guru Besar dalam Bidang Genetika (The Experience of Becoming a Professional Teacher. Professor Inauguration Speech in the field of Genetics)*. 2009. Malang, FMIPA UM.
- [8] Slavin R.E. Cooperatif Learning, Success for All, and Evidence based Reform in Education. *educational Didactique*, vo. 2, no. 2, pp.151-159, 2008.
- [9] Bahri, A. *Pengaruh Strategi pembelajaran Pengaruh Strategi Pembelajaran Reading Questioning and Answering (RQA) pada Perkuliahan Fisiologi Hewan terhadap Kesadaran Metakognitif, Keterampilan Metakognitif dan Hasil Belajar Kognitif Mhs. Jurusan Biologi FMIPA Universitas Negeri Makassar (The Effect of Reading Questioning and Answering (RQA) Learning Strategy in Animal Physiology Class on metacognitive Awareness, Metacognitive Skills and cognitive Learning Results of Biology Education Students of Mathematics and Science faculty, State University of Makassar)*. Unpublished Thesis, 2010. Malang: State University of Malang.
- [10] Bahtiar. *Pengaruh Strategi Pembelajaran Think Phair Share (TPS) dan Reading Questioning Answering (RQA) Terhadap Sikap Sosial, Ketrampilan Metakognisi, dan Penguasaan Konsep Biologi untuk Pendidikan Multietnis pada Siswa SMA di Ternate (The Effect of Think Phair Share (TPS) and Reading Questioning Answering (RQA) Learning Strategies on social Attitudes, metacognitive Skills, and Biology Concept Gaining for multiethnic Education of Senior High School Students in Ternate)*. Unpublished dissertation, 2013. Malang: State University of Malang.

[11] Hassanudin. *Pengaruh Pembelajaran Reading Questioning and Answering Dipadu Think Phare Share Berbasis Lesson Study terhadap Keterampilan Metakognitif dan Hasil Belajar Kognitif Mahasiswa Pada Mata Kuliah Anatomi Tumbuhan (The Effect of Reading Questioning and Answering Combined with Think Pair Share based on Lesson Study on Students' metacognitive Skills and cognitive Learning Results at Plant Anatomy Course)*. Unpublished dissertation, 2013. Malang: State University of Malang.

[12] Lie, A. *Cooperative Learning: Mempraktekkan Kooperatif Learning di ruang- ruang kelas (Implementing cooperative Learning in Classroom)*. Jakarta: Grasindo, 2008.

[13] Mamu, H. D. *Ketrampilan Berpikir Kritis dan Pemahaman Konsep IPA Biologi dalam Pembelajaran Berstrategi Kooperatif Tipe STAD (Critical Thinking Skills and of Biology Concept Gaining in a Learning based on cooperative Strategy of STAD)*. Proceedings of the seminar Nasional Sains dan Matematika II Jurusan pendidikan MIPA FKIP UNTAD, 2013.

[14] Prayitno, B. *Pengembangan Perangkat Pembelajaran IPA Biologi SMP Berbasis Inkuiri Terbimbing dipadu Kooperatif STAD serta Pengaruhnya terhadap Kemampuan Berfikir Tingkat Tinggi, Metakognisi, dan Keterampilan Proses Sains pada Siswa Berkemampuan Akademik Atas dan Bawah (Developing Learning Media of Biological Science Learning in Junior High School based on guided Inquiry combined with cooperative Strategy of STAD and Its Effect on the high-order Thinking Skills, Metacognition, and Science Process Skills in low and high academic Ability Students)*. Unpublished dissertation, 2011. Malang: State University of Malang.

[15] Ermin. *Pengaruh Pembelajaran STAD Dipadu TPS dan Kemampuan Akademik terhadap Keterampilan Metakognisi, Kemampuan Berpikir Kritis dan Hasil Belajar Kognitif Biologi pada Siswa Kelas VII SMP N 4 Kota Ternate (The Effect of STAD combined with TPS Learning and academic Ability on metacognitive Skills, critical Thinking Skills and Biology cognitive Learning Results of Class VII Students of Junior High School 4 Ternate)*. Unpublished Thesis, 2012. Malang: State University of Malang.

[16] Muldayanti, N.D. *Pembelajaran Biologi Model STAD dan TGT Ditinjau dari Keingintahuan dan Minat Belajar Siswa (Biology Learning Implementing STAD and TGT Models viewed from Students' Curiosity and Learning Interest)*. *Jurnal Pendidikan IPA Indonesia*, vol. 2, no. 2, pp.12-17, 2013.

[17] Santrock. J. W. *Psikologi Pendidikan (Educational Psychology)*. Translation by Harya Bimanesa. Jakarta: Penerbit Salemba. Bandung Remaja Rosda Karya, 2014.

[18] Zubaidah, S., Corebima A.D, Mistianah. *Asesmen Berpikir Kritis Terintegrasi Tes Essay (Critical Thinking Assessment integrated with Essay Test)*. Paper presented at the National

Seminar on Education Biology, Biology Symposium on Education (Symbion) at the University of Ahmad Dahlan Yogyakarta on April 4, 2015.

[19] Slavin. *Cooperative Learning: Theory, Research, and Practice*, 2005. London: Allymand Bacon.

[20] Wade, C. (1995). Using writing to develop and assess critical thinking. *Teaching of Psychology*, vol. 22, no. 1, 2005, pp. 24-28.

[21] Lubliner, S. Reciprocal Teaching: Alternative to Gate Keeping Practicies. *Journal Of Understanding Differences*. Volume 5, no. 3, 2001.

[22] Nurhadi. *Kurikulum 2004-Pertanyaan dan Jawaban (Curriculum 2004-Questions and Answers)*. Jakarata: PT Gramedia Widiasarana Indonesia, 2004.

[23] Sele. Y. *Perbandingan keterampilan metakognitif, kemampuan berpikir kritis dan karakter siswa dalam pembelajaran biologi melalui strategi Reciprocal Teaching, Think Pair Share dan Reciprocal Teaching dipadu Think Pair Share (TPS)(The Comparison of metacognitive Skills, critical Thinking Skills and Characters of the Students in Biology Learning through Reciprocal Teaching, Think Pair Share and Reciprocal Teaching combined with Think Pair Share (TPS) Learning Strategies)*. Unpublished Thesis, 2016. Malang: State University of Malang.

[24] Ennis, R. *Critical Thinking Assesment. Theory into Practice*, 2001 (Online), (<http://.scribd.com/doc/pdf/73886184/Ennis-Crritical-Thinking -assesment>) accessed on December 20, 2014.

[25] Fisher, A. *Critical Thinking An Introduction*. Cambridge: Cambridge University Pess, 2001.

[26] Facione, A.P. *Critical Thinking: What it is and why It counts*. Measured Reasons and The California Academic Press, Millbrae, 2013. (Online). (http://www.student.uwa.edu.au/_data/assets/pdf_file/0003/1922502/Critical-Thinking-What-it-is-and-why-it-counts.pdf Accessed on June 20, 2015)

[27] Salmon. M. H. *Introduction to logic and critical Thinking*. Boston : PreMedia Global, 2013.

[28] Widayati. *Pengaruh strategi Pembelajaran RQA dipadu Dengan TPS dan Kemampuan Akademik terhadap Kemampuan Berpikir Kritis dan Hasil Belajar Kognitif pada Pembelajaran Biologi Siswa Kelas VIII SMP di Kabupaten Blitar (The Effect of RQA combined with TPS*

Learning Strategy and academic Ability on critical Thinking Skills and Biology cognitive Learning Results of Class VIII Students of Junior High School in Blitar). Unpublished Thesis, 2015. Malang: State University of Malang.

[29] Zunaidah, N. *Pengaruh Strategi Pembelajaran Reading Questioning and Answering (RQA) dipadu Student Team Achievement Division (STAD) terhadap Kemampuan Berpikir Kritis dan Kemampuan Metakognitif Di MTs Negeri Rejoso Kab. Pasuruan (The Effect of Reading Questioning and Answering (RQA) combined with Student Team Achievement Division (STAD) Learning Strategy on critical Thinking Skills and metacognitive Skills in MTs Rejoso District of Pasuruan)*. Unpublished thesis, 2015. Malang: State University of Malang.