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Comparison on Critical Thinking Skill and Cognitive Learning Outcome among Students of X Grade with High and Low Academic Ability through *Reading Questioning Answering* (RQA) Strategy

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Abstract: Equity of education can be attained by the implementation of Reading Questioning Answering (RQA) learning strategy. RQA has potential to optimize the critical thinking skills and cognitive learning outcome of students. The aim of this study is to compare the critical thinking skills and cognitive learning outcome among students with different academic ability through RQA strategy. The subjects are students in X grade of SMA Al-Khairat and SMAN 5 Ternate. The result showed that the critical thinking skills percentage of low academic ability students is higher 5.691% than high academic ability students, and the cognitive learning outcome percentage of low academic students is higher 7.067% than high academic students. Therefore, RQA able to empower the critical thinking skills and cognitive learning outcomes of low academic ability students.

Key Words: critical thinking skills, cognitive learning outcome, academic ability, RQA strategy

Abstrak: Upaya pemerataan pendidikan dapat dilakukan melalui penerapan strategi pembelajaran *Reading Questioning Answering* (RQA). RQA diketahui berpotensi untuk mengoptimalkan keterampilan berpikir kritis dan hasil belajar kognitif siswa. Penelitian ini bertujuan untuk melihat perbandingan keterampilan berpikir kritis dan hasil belajar kognitif antara siswa berkemampuan akademik berbeda melalui strategi RQA. Subjek penelitian adalah siswa kelas X SMA AL-Khairaat dan SMA N 5 Kota Ternate. Hasil penelitian menunjukkan bahwa rata-rata presentase peningkatan keterampilan berpikir kritis siswa berkemampuan akademik rendah lebih tinggi 5,691% dibandingkan siswa berkemampuan akademik tinggi sedangkan rata-rata presentase peningkatan hasil belajar kognitif siswa berkemampuan akademik rendah lebih tinggi 7,067% dibandingkan siswa berkemampuan akademik tinggi. Jadi, RQA mampu memberdayakan keterampilan berpikir kritis dan hasil belajar kognitif siswa pada kemampuan akademik rendah.

Kata kunci: keterampilan berpikir kritis, hasil belajar kognitif, kemampuan akademik, strategi Pembelajaran RQA

Education is a determining process of the nation's advancement due to the fact education implementation will increase the human resource quality. By considering that fact, education equity for all students with high and low academic ability must be the absolute concern of teachers during the learning process. The urgency to create education equity has written under the constitution of national education system policy Number 20 in 2003 which explains that the education process is done in order to develop students' competence and characters. Through that process, all students are expected to become the devoted beings to God, creative, knowledgeable, independent, competent, and responsible democratic citizens with great characters. Therefore, all students will be able to contribute to nation's advancement.

The function of education is mainly to direct and encompass students in the learning process to achieve the expected learning objectives. The learning process should concern about the diverse academic ability of each student because the academic ability is one of

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the influencing factors of the success learning. Nasution (2000) and Hartono (2008) explained that students can be divided based on their academic ability into three categories which are high, medium, and low. Those individual differences should be taken into account by educators because giving the uniform and generalized learning experience for all students will not create the learning goal accomplishment equity. The inequity of learning goal accomplishment happens because the academically low students take a longer time to understand learning materials compare to students with high academic ability. Thus, it is an undeniable fact that academically low students need bigger concern than students with high academic ability.

Critical thinking skill is one of high-level thinking skill that becomes the indicator of learning goal accomplishment and skill that need to be attained by students. The critical thinking skill empowerment that is done consistently in the learning process will make students competent in managing their learning process independently and increase their thinking skill (Hennessey, 1999; Livingston, 1997; Hollingwoth & McLoughlin, 2001; Dawson, 2008; Lee, 2009). Further, students will also be able to give the correct response to various problems that they face because they have the skill to analyze those problems, arrange the solving strategy, implement and evaluate that implemented strategy (Ennis, 1991; Fisher, 2001; Facione, 2013; Salmon, 2013). At the end, critical thinking empowerment will determine the learning quality (Corebima, 2006; Dauphin, 2013).

The other indicator that also shows the learning goal accomplishment is the students' cognitive learning outcome. Asep & Haris (2013) stated that cognitive learning outcome is all things that students have as results of learning activity that they do. Further, Nurkancana and Sunartana (1986) explained that cognitive learning outcome can be found out through measurement by using test regarding particular learning materials to collect the numerical data or score. Therefore, The successful students in learning are those students who accomplish the learning goals indicated by the optimum score of their cognitive learning outcome. The optimum critical thinking skill and cognitive learning outcome are inseparable from the teachers' role. The role of teachers that has a big influence to increase learning quality is the role to be a facilitator. Regarding the role of teacher to be a facilitator, the teacher should be responsible for helping students' learning process well, be patient, appreciative, fair, friendly, firm, opened, and positive. Thus, it is obvious that the teacher should facilitate students' learning process, especially for those students who are academically low.

One of the ways to facilitate students' learning process is by implementing active learning strategy that encourages students to learn actively and potentially empower the critical thinking skill. That strategy is called as *Reading Questioning and Answering* (RQA) strategy. RQA strategy is based on the fact that the vast majority of students who get the task to read don't do as they are told. It becomes the hindrance for the designed learning process and causes low understanding of students on learning materials. RQA strategy is proven as a reliable strategy to incentivize students to read the instructed learning materials and make questions based on it. Thus, the designed learning process can be implemented as well as increasing students' understanding of learning materials (Corebima, 2009).

The big potential benefits of RQA strategy to increase critical thinking skill of students and learning outcome have abundantly reported through previous researches. Bahri (2010), Bahtiar (2013) and Hasanudin (2013) reported that using RQA strategy can increase cognitive ability, critical thinking skill, and social competence of college students. The increasing of cognitive ability, critical thinking skill, and other skills is caused by reading (R), creating substantial questions (Q), and answering the questions (A) which are an important cognitive process in increasing learning outcome and students' thinking process.

Even though the information regarding the effect of RQA strategy on critical thinking skill and cognitive learning outcome has been explored by the previous researchers, the information regarding the comparison between critical thinking skill and cognitive learning outcome has not been done before. Therefore, it is urgent to conduct a research that intends to find out the effect of RQA strategy on critical thinking skill and cognitive learning outcome among students with high and low academic ability.

METHOD

This research is a quasi-experimental research with nonequivalent control group design pretest-posttest. This research's design can be seen in Table 1.

The population in this research is all X grade students of Senior High School in Ternate. The sample of this research is X grade students of SMAN 5 Kota Ternate class F which consist of 25 students as an academically high group. While the academical-

Table 1. Design Of Quasi Experiment Research With Nonequivalent Control Group Design Pretest-Posttest

Group A	**O_1**	**A_1**	**O_2**
Group B	**O_3**	**A_2**	**O_4**

In which:
O1 and O3 = *Pretest Score*
O2 and O4 = *Posttest Score*
A_1 = Academically high group with RQA learning treatment
A_2 = Academically low group with RQA learning treatments
(Source: Tuckman, 1978)

ly low group is taken from X grade students of SMA AL-Khairaat class X_1 which also consists of 25 students. The sample is determined based on *simple random sampling* technique derived from the result of classes' equality test.

The instrument which is used to measure the critical thinking skill and cognitive learning outcome is essay test. The data are obtained by giving the test before and after the treatment. The obtained data then will be tested for its normality and homogeneity and analyzed by using Covariate (Ananova) analysis.

RESULTS

The Data from the result of the research consist of pretest and posttest score of critical thinking skill and cognitive learning outcome that will be analyzed by using anacova analysis. Before that, there should be a test of *Levene* and *Kolmogrov* Smirnove's prerequisite. The result of *Levene* and *Kolmogrov* Smirnove's prerequisite shows that pretest and posttest data are distributed normally and homogeneously.

The resume of Covariate analysis and *Least Significant Difference* (LSD) test. The comparison on critical thinking skill of students who get RQA treatment can be seen in Table 2 and 3.

Table 3. Percentage Of Increasing On Critical Thinking Skill Of Students With High And Low Academic Ability

Model	Increasing from pre to post (%)
1 = High	80,878
2 = Low	86,569

Based on Table 2, the significance value of critical thinking skill is 0,015. That means that Ho is accepted and the research hypothesis is refused. It implies that there is no difference in critical thinking skill among students with high and low academic ability with RQA treatment. Table 3 shows that the average increasing of critical thinking skill of academically low students is 86,569%. That percentage is 5,691% higher than academically high students. This means that the increasing of critical thinking skill of academically low students is higher than academically high students.

Regarding the cognitive learning outcome, the significance value of cognitive learning outcome from *Least Significant Difference* (LSD) test is shown in Table 4 and Table 5.

Based on Table 4, the significance value of cognitive learning outcome is 0,437. Therefore, Ho is accepted and the hypothesis in this research is refused.which means that there is no difference on cognitive learning outcome among students with high and low academic ability with RQA treatment. Table 4 shows that the average increasing of academically low students' cognitive learning outcome is 86,609%. This percentage is 7,067% higher than academically high students. It shows that the increasing of cognitive learning outcome for academically low students is higher than academically high students.

Table 2. Resume Of Anacova Of Comparison On Critical Thinking Skill Among Students With High And Low Academic Ability

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	569,154[a]	2	284,577	3,160	,052
Intercept	22366,866	1	22366,866	248,396	,000
XKritis	568,873	1	568,873	6,318	,015
KAkademik	,594	1	,594	,007	,936
Error	4232,127	47	90,045		
Total	250326,563	50			
Corrected Total	4801,281	49			

Table 4. Resume Of Anacova Of Comparison On Cognitive Learning Outcome Among Students With High And Low Academic Ability

Dependent Variable: YHBKog

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	109,688[a]	2	54,844	,413	,664
Intercept	11657,536	1	11657,536	87,834	,000
XHBKog	81,563	1	81,563	,615	,437
KAkademik	17,478	1	17,478	,132	,718
Error	**6237,968**	**47**	**132,723**		
Total	**236274,414**	**50**			
Corrected Total	**6347,656**	**49**			

Table 5. Percentage Of Increasing On Cognitive Learning Outcome Of Students With High And Low Academic Ability

Model	Improvement from pre to post test (%)
1 = High	79,542
2 = Low	86,609

DISCUSSION

Difference on Critical Thinking Skill among Students of X Grade with High and Low Academic Ability in Biology Subject through *Reading Questioning Answering* (RQA) Strategy

The result of Anacova test shows that there is a significant difference in critical thinking skill among students with high and low academic ability. The average of critical thinking skill of academically low students is 86,569% and it is higher than academically high students. This result explains that the biology learning process that uses RQA strategy can increase the critical thinking skill of students with high and low academic ability. Students with high academic ability get their critical thinking skill increased in the percentage of 80,879% and 86,569% for the students with low academic ability. Therefore, the increasing critical thinking skill is bigger on students with low academic ability.

The huge potential benefits of RQA strategy show that steps of learning activity can encourage students with lower academic ability to enforce their critical thinking skill. There are important syntaxes to implement the RQA strategy which is Reading (R), arranging substantial question (Q), and answering the questions (A). Those syntaxes make academically low students got bigger change and time to sharpen their critical thought. This fact is consistent with what Prayitno's (2010) suggestion which explains that sufficient learning time can support the academically low students to comprehend the learning materials so their learning achievement will increase and the learning process will be more meaningful. This research finding is also in line with what Bahri (2010) reported that the implementation of RQA model could increase the critical thinking skill, especially for academically low students.

Difference on Cognitive Learning Outcome among Students of X Grade with High and Low Academic Ability in Biology Subject through *Reading Questioning Answering* (RQA) Strategy

The result of Anacova test shows that there is a significant difference in critical thinking skill among students with high and low academic ability. The average of critical thinking skill of academically low students is 86,609% and it is higher than academically high students. This result explains that the increasing critical thinking skill is bigger on students with low academic ability.

Based on the data analysis, *Reading Questioning Answering* (RQA) strategy can increase cognitive learning outcome better for academically low students than academically high students because in RQA strategy, there are cognitive processes which include Reading (R), arranging substantial question (Q), and answering the questions (A). Based on Corebima (2009), individually, students are forced to read and understand comprehensively in order to find the substantial or very substantial meaning of the text they read. When the substantial meaning of the text has been found, the students will prepare to ar-range the questions which represent what they read and answer those questions. Finally, the students will exchange the information they have through presenting it in front of the class (Bahtiar, 2012).

Manohar (2010) also explained that arranging questions enables students to further analyze the information they have while; giving questions will reinforce the resuming strategy to increase the understanding of readers. Nurhadi (2004),argued that questioning is one of the bases of contextual learning, questioning can be used by students actively and critically to enrich the information, solving the ideas and opinions so that the cognitive learning outcome will increase. Other related researches on the effect of RQA strategy on cognitive learning outcome of academically low students have not been reported yet. The research conducted by Hassanudin (2013) explains that the learning activity which is developed through RQA strategy will potentially increase the metacognitive skill and cognitive learning outcome of college students. This fact is consistent with the research conducted by Widayati (2015). She reported that implementation of RQA strategy can increase the critical thinking skill and cognitive learning outcome of students with low academic ability.

CONCLUSION AND SUGGESTION

Conclusion

Based on the research finding, the conclusion of this research is there is a significant difference in critical thinking skill among students with high and low academic ability after implementing RQA strategy. This result shows that biology learning activity using RQA strategy can increase the critical thinking skill and cognitive learning outcome of students with low and high academic ability. On critical thinking ability, the students with low academic ability increase 5,691% higher than students with high academic ability. On cognitive learning outcome, academically low students increase 7,067% higher than students with high academic ability.

Suggestions

Based on this research conclusion, it is highly suggested that Teachers implement RQA strategy in Biology learning activity because it is proven that RQA strategy can potentially increase the critical thinking skill and cognitive learning outcome of academically diverse students, especially for academically low students. Besides that, students should be motivated and encouraged during the implementation of RQA strategy related to learning goals so that students will be more proactive to participate in the learning process.

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