



Analysis of Students' Critical Reading Ability in Science Learning Using the Argument-Based SQ3R Method

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Abstract

The challenges that students will face in the future are complex, so students need a myriad of competencies. To be able to compete and face challenges in the industrial era 4.0, one of which is the ability to process information and communicate. This study aims to analyze the effect of the argument-based SQ3R method in improving students' critical reading skills in science learning. This research is a Quasi-Experimental study with a randomized pretest-posttest control group design. The research sample consisted of 62 class VIII students consisting of two classes. The technique for collecting data on reading interest used a questionnaire sheet instrument and data on the results of students' critical reading ability used essay questions. Based on the results of the research data analysis, it was shown that the argument-based SQ3R learning method had a positive effect on students' critical reading skills, with the results of the t-test showing Asymp. sig. of $0.00 < 0.05$, with supporting data on students' critical reading skills seen from the student's reading interest questionnaire with the results of the Mann Whitney U-test showing Asymp. Sig of $0.018 < 0.05$ which means that there is an influence of the argument-based SQ3R learning method on students' critical reading skills.

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INTRODUCTION

Education is an important factor in human life. Since formal education has implemented the 2013 curriculum using a scientific approach, students are required to have creative and innovative abilities, utilize technology and information, communicate and work together (Ramli, 2017). Science learning in this era is closely related to technology because science studies cover aspects of products, processes, scientific attitudes, and applications (Kemendikbud, 2019). The challenges that students will face in the future are complex, so students need a myriad of competencies (Tsai, 2018). To be able to compete and face challenges in the industrial era 4.0.

Character development and strengthening as well as literacy activities are important elements in the progress of a country in living life in the current industrial 4.0 era (Sedita, 2018). The reading ability is needed to realize this important element because the process of processing information in acquiring knowledge is greatly influenced by the ability to read and process information (Osborne, 2013). Reading is an absolute requirement in learning activities. Critical reading is part of the essential values needed by students in their reading skills (Rohmah, 2018).

Text or reading material with a scientific context, namely text or reading that can improve the ability to understand scientific skills knowledge by identifying questions, acquiring new knowledge, explaining scientific phenomena, drawing conclusions based on facts, understanding the characteristics of science, awareness of how science and technology shape the natural, intellectual, and cultural environment, and the willingness to be involved and care about issues related to science (OECD, 2016).

The learning process that has existed so far is mostly still in the form of knowledge transfer from teacher to student. Science material which is very much compared to other subjects results in teachers transferring more knowledge without giving students opportunities to build and discover their knowledge. This happens because most teachers pursue a narrow learning time but are faced with a lot of subject matter. Conditions like this make students less able to understand any material presented because they have not received meaningful learning. Meaningful learning is

learning that can direct students to build and justify their knowledge claims (Berland & McNeill, 2010).

Learning with the SQ3R method will direct students to be able to read the material carefully. Reading using this method can lead to an active role for students because students are directly involved in the teaching and learning process (Abidin, 2017). Based on the learning steps, the SQ3R method can also provide new experiences for students in the process of gaining knowledge. Based on observations and interviews with students. Most students forget the material that has been studied before because of the large amount of material and studies in science. However, by using the SQ3R method the level of students' understanding and memory of the subject matter will be longer and longer term, because it is facilitated by the learning stages of this method.

The SQ3R learning method is a way of studying texts (readings) specifically contained in books, scientific articles, and research reports (Asiri, 2017). Students will easily remember the material because students study in groups and are allowed to be more active in finding and understanding material from texts or books (Pratama, 2015) so there is a greater opportunity to improve science learning outcomes in the subject matter of the digestive system. In addition, by incorporating the skills of arguing and communicating all of their knowledge in learning, the level of student understanding can reach 90% (Triyoso, 2019).

There needs to be a change in learning that can facilitate students to be able to develop the skills needed in this era, one of which is the ability to read critically to properly process information. The application of the argument-based SQ3R method in this study will be used as a solution to the problems faced by students.

METHOD

This research is *Quasi-Experiment* research. The research variable is an increasing in critical reading ability which is analyzed quantitatively. The process of learning activities is carried out using the argument-based SQ3R learning method. This study aims to determine the effect of the argument-based SQ3R method on students' critical reading skills. This research was conducted at MTsN 1 Magelang Regency by involving a research sample of class VIII

students for the 2022/2023 academic year. The research subjects were 62 students who were divided into 2 classes. The research design is a randomized pre-test-post-test control group design.

Table 1. Research design randomized pre-test-post-test control group design

Group	Pretest	Treatment	Posttest
Experiment	O1	X1	O2
Control	O1	X2	O2

Data collection techniques used to test techniques using initial test questions (pretest) and final tests (posttest) to determine learning outcomes after treatment. Then the data collecting technique uses a non-test technique with a questionnaire sheet to determine students' reading interests as a support for students critical reading abilities. The type of questionnaire used in this study was a questionnaire instrument using a Likert scale consisting of positive questions and negative questions. The categories of answers in this questionnaire are as follows:

Table 3. Mann Whitney U-test results

Class	N	Means	SD	asymp.Sig.	Information
Control	31	76.90	7.10		Ho rejected
Experiment	31	82.19	8.90	0.018	Ha accepted

Data in Table 3 shows the statistical results of the Mann-Whitney U test on the research results in the form of students' reading interest with Asymp scores. Sig. 0.018 < 0.05, so Ho is rejected and Ha is accepted. This means that there is an influence of the Argument-based SQ3R learning method on students' critical reading skills seen from their reading interest.

Critical reading ability is a reading activity that shows a critical reaction to what is being read to respond to ideas and relationships between implicit and explicit reading content in a reading (Din, 2020). Students' critical reading ability in this study can be increased as seen from students' reading interest as measured using a questionnaire instrument with a Likert scale. Measuring students' reading interest in this study used several indicators according to Crow and Crow adapted from research (Arinda, 2018), including 1) feeling happy reading books 2) focus on reading books 3) interest in books

Table 2. Likert Scale Category

Evaluation	Mark
SS (Strongly Agree)	4
S (Agreed)	3
TS (Disagree)	2
STS (Strongly Disagree)	1

Source: (Sugiyono, 2015: 136).

The student reading interest questionnaire was made based on the indicators described according to (Crow and Crow,1998). Instrument items are developed as needed with indicators.

RESULTS AND DISCUSSION

The results of this study were tested using the SPSS Version 26 application. The results of the reading interest questionnaire were tested using the Mann-Whitney U-test statistic. Tests were carried out to determine whether there was any influence of the Argument-based SQ3R learning method on critical reading skills. The statistical results are as follows:

4) motivation to read books 5) the emotion and effort to read the book.

The reading sources provided are readings that discuss case studies related to the material of the digestive system. So students' interest in mastering the material is higher because the cases discussed are very close to everyday life. This is the opinion of Nadhirah (2018: 105) that learning using the SQ3R method has many advantages in improving students' reading skills compared to other methods. Then the pretest and posttest reading ability data were tested with the following results:

a) Pretest

After conducting prerequisite tests on the data on critical reading ability scores, it was found that the normality test on pretest and posttest values had been fulfilled as indicated by normally distributed data. Therefore testing the pretest value can be done by parametric test using the t-test. Test results can be seen in the table below:

Table 4. T-test Results from Critical Reading Ability Pretest Value

Class	F	Sig. (2-tailed)	Information
Control			H0 is accepted and Ha is rejected
Experiment	0.003	0.380	

Data in Table 4 shows the statistical results of the T-test which shows a Sig. (2-tailed) value of $0.380 > 0.05$ so that H_0 is accepted and H_a is rejected. So it can be seen that there is no difference in the average pretest scores between students in the control class and the experimental class on the material of the human digestive system before being treated with the application of learning methods.

b) Posttest

Test results Posttest value t-test on Critical reading ability in the control class and the experimental class. The test results can be seen in table 5 as follows:

Table 5. T-test results Posttest scores for Critical Reading Ability

Class	F	Sig. (2-tailed)	Information
Control			H_0 was rejected and H_a was accepted
Experiment	1.117	0.000	

Data in Table 5 shows the statistical results of the post-test t-test scores after being treated with the argument-based SQ3R learning method. Sig. Value (2-tailed) of $0.000 < 0.05$, so that H_0 is rejected and H_a is accepted. So the argument-based SQ3R learning method has a positive effect on students' critical reading skills.

Compared the results of the analysis of the reading interest questionnaire and the cognitive results of students' critical reading skills have a positive effect so it can be said that the improvement of students' critical reading skills can be measured from reading interest. High reading interest in students will result in students' motivation and interest in reading so student learning outcomes will also increase along with students' critical abilities (Novitasari, 2018).

Students' critical reading skills in the experimental class were higher than those in the control class. During the learning process using the argument-based SQ3R learning method, class

learning begins with giving a little material by the teacher related to the material on the human digestive system. However, in the learning process, the teacher acts more as a facilitator. Students are then grouped and given several reading sources related to the material so that students can actively formulate problems in reading in sequence according to the steps in SQ3R learning.

In each learning process with SQ3R step the teacher always directs students to argue with each other among friends in their group. Argument activities are useful for exchanging information that each students has obtained. So that the activities of mutual argument between students make it easier for students to understand the material and improve students' critical reading skills (Fadhillah, 2017).

These result are also in line with research conducted by Muhiddin (2020) who concluded that the application of the SQ3R method was able to improve student learning outcomes. This can be seen from the results of students' critical reading skills which increased so that students' mastery of concepts increased especially in science material.

CONCLUSION

The argument-based SQ3R method has a positive effect on students' critical reading skills in terms of students' reading interests. Learning using the argument-based SQ3R method is recommended for use in science learning, especially material on human digestive system which is proven to be able to improve students' critical reading skills.

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