Motivation of Prospective Science Teacher While Reading Texts as a Part of Self-Regulated Learning: Study on Critical-Argumentation Reading Activities

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ABSTRACT

Reading is an important activity that must be present in the science learning process, especially reading with meaningful activities, one of which is critical argumentation reading activity. Reading is very closely related to student motivation while reading. This motivation plays an important role in supporting the success of reading goals. So far, research related to students' reading motivation has rarely been carried out, especially for critical argumentation reading activities. Most of the research was conducted at the elementary and secondary school levels. Therefore, this research will be conducted with the aim of analyzing students' motivation while reading using critical argumentation activities. This study involved 83 science teacher candidate students. In practice, students were divided into three classes, namely group experimental class (N = 29), individual experimental class (N = 29), and control class (N = 25). The research was conducted using the think aloud protocol method, in which students were asked questions while reading the text, and recorded all the answers orally. The results showed that students' motivation during reading as part of a self-regulation strategy showed better results when students read using the critical argumentation reading model. In addition, students are able to carry out self-regulation strategies from a better motivational aspect if reading activities are carried out in groups.

Kata Kunci: argumentation-critical reading activity, reading motivation, self regulated learning

INTRODUCTION

Reading activities play an important role in science learning activities. According to Michalsky (2013), the activity of reading scientific texts involves cognitive processes that can be a link in scientific thinking activities such as observing, classifying, inferring, predicting, formulating hypotheses, and elaborating questions. Thus, through reading scientific texts, students can be facilitated to learn how scientific knowledge is developed, formed, and understood in various models of scientific reasoning (Fang, 2010; Norris, 2009; Siswanto, 2022). Therefore, through reading scientific texts, students can be facilitated to get used to complex scientific thinking.

In carrying out reading activities, one of the important factors that support success in reading activities is motivation. Reading activities involve immersive reading experiences when interacting with texts, so that readers must activate their thinking skills. Equipping students with motivation to read means giving them relevant and real reasons to read, as well as instilling in students a desire and need to read. In this study, the motivational aspect was examined when students read with a critical argumentation reading activity design. The motivation studied is based on self-regulated learning components which include resource management, causal

attributes, control over actions, and feedback (Michalsky, 2013).

Aspects of motivation in reading are important to investigate in reading scientific texts (Schutte, 2007). Both provide an important role in the success of the learning process using reading activities (Wigfield, 2016), because it relates to the ability and willingness of students to carry out reading activities. In fact, these two things are rarely studied, especially at the adult (student) level (Schutte, 2007), most research is done on students in primary and secondary schools (Siswanto, 2021).

Therefore, based on this, students' reading motivation needs to be raised in the design of the developed reading model. This is done with the aim of making a positive impact on the achievement of reading comprehension skills. So, indirectly when the achievement of reading comprehension skills gets better, the skills of argumentation and critical thinking become more improved.

METHOD

This research was conducted using the think aloud protocol method (Michalsky, 2013). In this method, students are asked to verbally express all their thoughts when reading scientific texts. The students involved in this study were 83 science teacher candidates who were divided into three classes. The first class carried out reading activities with critical argumentation activities in groups (29 students). The second class carried out reading activities with critical argumentation activities individually (29 students). The third class carried out traditional reading activities (25 students), where students were given texts and then asked to read.

In this study, the researcher prepared several questions while students were reading scientific texts to explore students' motivation while reading. These questions are inserted in the reading activity sheet. The questions asked to students referred to indicators of reading motivation as part of a self-regulated learning strategy which included four aspects, namely resource management, causal attributes, control over actions, and feedback (Michalsky, 2013). Question details can be seen in Table 1. Furthermore, while answering questions, students individually record the answers to each of these questions.

Table 1. List of Questions

Numbers	Question
1	This text consists of several paragraphs containing scientific content. Are you sure you can finish reading this text well? Why?
2	What made you sure/not sure about completing this process?
3	After reading several paragraphs in this text, are you still sure you can finish this text? Why? And, do the questions in this activity challenge you to keep reading?
4	If you feel unable to finish reading this text, what will you do?
5	While reading, what did you do to complete this assignment?
6	Do you feel that you have done a good job of reading? Explain!
7	What things have been done in an effort to complete the text reading activity well?

Furthermore, data processing is carried out by making transcriptions of student recordings and evaluating the results of the transcriptions. Transcription

is categorized into motivational aspects which are part of the self-regulated learning component which consists of four aspects which include resource management, causal attributes, control over actions, and feedback (Michalsky, 2013). In more detail, examples of categorization and assessment can be seen in Table 2. To ensure reliability in categorizing the data, researchers conducted an intercoder reliability test. Where, several samples of the results of the categorization that had been carried out by researchers were analyzed by two other researchers (Cetin, 2014). The results of the reliability test for categorizing argumentation skills in this study showed reliable results with a kappa coefficient of 0.773.

Table 2. Examples of Categorizing and Assessing Motivation During Reading

Category	Example of transcription results and their assessment
Self-management of resources	- I feel unsure or don't have a good idea to continue reading this process (Score 0) - I stopped reading (Score 0) - I must continue and will not give up (Score 1) - I feel unable, but I will try to diligently read in order to become capable (Score 1)
Causal attribute	- I'm not sure and don't know what the cause is (Score 0) - I'm not sure because I can't do good timing (Score 1) - I'm very confident I can solve this because it's easy (Score 1)
Control over actions	- If I am unable to complete this reading I will discuss it with a group of friends (score 1) - I read more carefully to understand the purpose and content of the text (1 point) - If I feel unable, I will give up, the important thing is that I try to keep reading (scored 0)
Feedback	- I feel I have done well enough to do this reading assignment because I can understand and can complete this assignment well (1 point) - I have not succeeded in doing this activity, because I have difficulty understanding the material (score 0)

After the assessment, the researcher then calculated the average difference test for the three classes using the Kruskall Wallis test. This test was carried out because the data obtained was not normally distributed. Then, the researcher also calculated the achievement of motivation during reading as a whole and for each indicator in each class. Achievements of motivation during reading are categorized into three categories as shown in Table 3. This categorization was made using categorization rules for abnormal data distribution (Azwar, 2014).

Table 3. Categories of Attainment of Motivation During Reading

Category	Score
High	$X > 3.13$
Medium	$2.79 \leq X \leq 3.13$
Low	$X < 2.79$

RESULT AND DISCUSSION

The results showed that there was a significant difference in average motivation during reading between the experimental group class (Mean rank = 55.64; n = 29), the individual experimental class (Mean rank = 50.33; n = 29), and the control class (Mean rank = 16.52; n = 25), where the significance value is <0.05 (p = 0.000). These results indicate that the treatment given in the three classes has a different impact on students' motivation during reading as part of a self-regulated learning. The achievement of the category of motivation during reading as part of the self-regulated learning in the three classes shows the results as shown in Table 4. In the group experimental class and individual experimental class, the achievement of motivation during reading was in the high category and in the control class it was in the low category.

Table 4. The Achievement of Motivation During Reading Category in the Three Classes

Class	Score	Category
Group Experiment Class	3,51	High
Individual Experiment Class	3,32	High
Control Class	1,91	Low

Table 5. The Achievement of Student Motivation Results During Reading

Meeting	Self-management of resources			Causal attribute			Control over actions			Feedback		
	Ek	Ei	K	Ek	Ei	K	Ek	Ei	K	Ek	Ei	K
1	93	93	48	97	93	44	97	97	56	83	83	48
2	86	76	48	93	76	48	97	97	60	76	83	44
3	86	76	44	83	76	44	97	93	60	76	76	36
4	83	76	44	83	76	60	100	93	60	76	66	32

In addition, the achievement of students' motivation while reading for each indicator can be seen in Table 5. The four indicators of motivation during reading, namely self-management resources, causal attributes, control over actions, and feedback can be facilitated properly through reading activities carried out (reading using critical-argument activities). Based on the data, for each indicator, the results in the group experimental class (Ek) showed better results compared to the individual experimental class (Ei) and the control class (K). Even so, the results in the individual experimental class were better than the control class. These results indicate that the developed reading activities are able to foster better motivation during reading when compared to traditional reading activities, and group activities carried out are able to encourage better outcomes when compared to those carried out individually. Some examples of self-regulated learning that emerge when
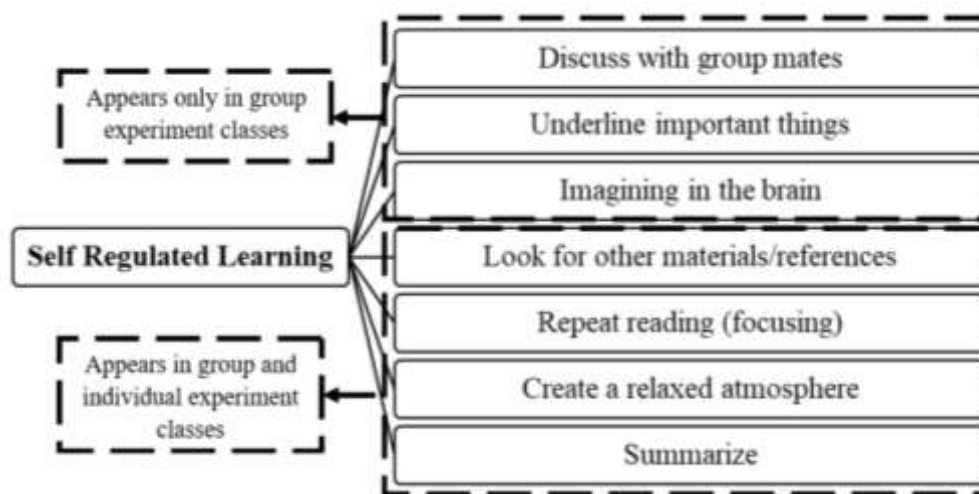
reading by students can be seen in Figure 1.

Figure 1. Several self-regulated learning that appears when students read

The results showed that the achievement of students' motivation during reading showed results in a high category for the experimental class (both group and individual experiments) and a low category for the control class. These results indicate that reading activities built in the experimental class are proven to make students have good self-regulation strategies from the aspect of motivation. As it is known that self-regulation strategies from the aspect of motivation refer to individual beliefs in their own abilities to be able to complete tasks and achieve goals, and to be able to overcome obstacles to achieve results in certain situations (Schraw, 2006).

The results of good motivation during reading in the experimental class were due to clear instructions in each reading activity carried out. Reading activities carried out with good reading strategies greatly impact self-regulation strategies when reading so as to achieve optimal results. Several studies have shown that the use of good reading strategies, such as asking questions to students, can make students' motivation to read better (Michalsky, 2013).

In this study, the stages of reading are divided into three stages, namely the stage before reading, the stage during reading, and the stage after reading. At each of these stages, students are given instructions in the form of questions or statements. These questions or statements help students to facilitate reading activities, especially to understand the important points of reading through investigative activities in the text. This makes the student's self-regulation strategy in the aspect of motivation better. According to research results, good adaptation of students to carry out reading activities is very helpful in cultivating good self-regulation strategies in reading (Souvignier, 2006; Michalsky, 2013).

In this study, the results of motivation during reading which were carried out in groups also showed the same thing as the findings of motivation between before and after reading. In the group experimental class, students' motivation while reading showed the best results. This further strengthens the evidence that group

activities really have an impact on growing students' motivation to read. These results support the research findings of Shaaban (2006) that reading activities carried out in groups can increase students' reading motivation. As previously explained, group activities make it easier for students to complete reading assignments well, making it easier for students to achieve their main goals. This convenience makes students motivated to complete the learning process. The results of Lau's research (2003) show that motivation will arise when students succeed in understanding the content of the text they read.

In addition, the findings in this study indicate that group work carried out by students is able to bring up more self-regulation strategies compared to individual work. This is very possible because involving students in group activities and interacting with peers is an important aspect of learning that is able to develop positive interactions and learning outcomes for students (Johnson, 2011). Besides that, reading is related to literacy practices, and literacy is not an action that is explored in isolation through individual activities (Boardman, 2015).

CONCLUSION

Based on the results of the research above, it can be concluded that students' motivation during reading as part of a self-regulation strategy shows better results when students read using the critical argumentation reading model. In addition, students are able to carry out self-regulation strategies from a better motivational aspect if reading activities are carried out in groups.

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