Examining Junior High School Student's Self-efficacy of Literacy and Numeracy

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Abstract. Self-efficacy is an important ability to understand learning and achievement in education. Students learning experiences are important for the development of self-efficacy, including literacy and numeracy skills which require processing and habituation so that cannot be obtained in a short time. This research aimed to examine junior high school student self-efficacy of literacy and numeracy using descriptive quantitative method. A self-efficacy questionnaire was distributed to 149 junior high school students who had participated in a national assessment simulation that measured literacy and numeracy skills in North Aceh, Indonesia. The questionnaire was used to measure three dimensions of self-efficacy that consisted of 45 statements. The score of students was categorized into four-level and analyzed for each indicator. The result of this research showed that the average student self-efficacy for the magnitude dimension was 65.63% and 67.22% for the strength dimension, these two dimensions are in the moderate category. Meanwhile, for the general dimension, a score of 70.22% was obtained in the high category. Of the three dimensions of self-efficacy, most of the students are in the moderate category for the dimensions of magnitude and strength, this indicates that students' self-efficacy in literacy and numeracy still needs to be improved.

Keywords: Junior high school student · self-efficacy · literacy · numeracy

1 Introduction

Literacy and numeracy skills are very important competencies that are general and basic skills in education. The study found that early literacy and numeracy mastery determine student success at higher education levels [1]. In simple terms, literacy skills are not only the ability to read, but also a person's ability to apply these skills to explain, connect, analyze, understand concepts in a context, and clearly distinguish the complexities of the world and their applications in everyday life. Low literacy skills will have an impact at every stage of life, especially in education, as a child it will be difficult to understand learning at school [2]. While numeracy skills can be interpreted as the ability to apply mathematical concepts in life and the ability to interpret quantitative information that is

around us. According to the Organization for Economic Cooperation and Development (OECD), Numeracy skills are a person's ability to implement, formulate, analyze, and interpret mathematics in various contexts [3]. Numeracy skills are not only understanding theoretically, but also a person's ability to use knowledge and skills that are closely related to mathematical modeling, interpreting, and evaluating results [4]. The quality of education in Indonesia as seen from the results of PISA, TIMSS, and Indonesian Student Competency Assessment is still relatively low. Over 50% of Indonesian fifteen-year-olds have not mastered basic skills such as literacy and numeracy [5].

Learning in the era of the industrial revolution 4.0 towards society 5.0 in an educational perspective is carried out by integrating various aspects including literacy and numeracy that affect the achievement of national education goals, the Indonesian education system needs to adjust relevant learning patterns. As in other areas of Indonesian education, student assessment has seen many changes in recent years. The Indonesian government has made various innovations and policies in the educational system to improve the quality of education. One of the policies implemented was the abolition of the National Examination, which is a tool for evaluating learning outcomes at the end of each level of education with a national standard, replaced by the National Assessment. In National Assessment, two things will become national standards in the field of education, namely the Character Survey and the Minimum Competency Assessment. This is one of the steps to prepare students to face charges in the order of life in the era of society 5.0, besides that it is also used to map the quality of education in Indonesia with international standards. The Minimum Competency Assessment focuses on measuring students' thinking competence based on literacy and numeracy [6].

Another basic skill that is important for students is self-efficacy. Self-efficacy is also known as part of the social cognitive theory which refers to an individual's perceived capability to perform a given academic task [7]. Self-efficacy is a belief about what a person is capable of doing or learning. Self-efficacy is the idea of personal beliefs that are the main basis and determinants of a person's behavior and actions. This means that students prefer to do activities within their reach of perceived competence, they tend to choose tasks and activities that they feel competent and avoid those that they are not good at [8]. Self-efficacy can have a positive influence where people who have high self-confidence become more confident in their duties so that they can improve performance. The higher the self-efficacy, the higher the confidence in one's ability to achieve success [9].

Self-efficacy assessments are generally measured through three basic scales (dimensions), namely: magnitude, strength, and generality [10]. The magnitude dimension focuses on the individual's belief in the ability to complete the task. In its magnitude dimension, namely the level of task difficulty that is believed to be handled. Strength reflects an individual's confidence at completing the various components of the task or at various levels of difficulty. The strength here refers to the extent to which the strength (strong or weak) of belief is possessed. Finally, generality is very important when understanding how self-efficacy on one task generalizes to other related tasks, such as academic ability. This dimension refers to the extent to which the situation can be covered by the belief in a person's abilities [11]. Based on the description above, literacy and numeracy skills, as well as self-efficacy are two important things that affect

student success in Minimum Competency Assessment. This research aimed to examine junior high school students' self-efficacy of literacy and numeracy. Therefore, this research is focused on analyzing the self-efficacy of junior high school students towards the literacy and numeracy abilities tested in the Minimum Competency Assessment.

2 Method

In this study, the researcher wanted to analyze the self-efficacy of junior high school students on literacy and numeracy skills. This research used the qualitative method with a descriptive design. The population of this research was the junior high school students in North Aceh, Aceh, Indonesia. The sample was 149 junior high school students who had participated in the Minimum Competency Assessment simulation that measured literacy and numeracy skills.

To measure junior high school student self-efficacy, a questionnaire consisting of 45 statements was distributed to the junior high school student after participating in the Minimum Competency Assessment simulation. A questionnaire was developed based on three dimensions of self-efficacy which were (1) magnitude, (2) strength, and (3) and generality. The question consisted of four options which Very Agree (4), Agree (3), Disagree (2), and Very Disagree (1). For negative statements, the score is the opposite. Overall, there were 27 statements for positive statements and 18 negative statements. After data was collected, the next step was data analysis. First, self-efficacy's scores for negative statements were converted, then data were grouped into four categories, i.e. low, medium, high, and very high.

3 Result and Discussion

The self-efficacy measurement test for literacy and numeracy in junior high school students in the North Aceh region was carried out based on self-efficacy dimensions consisting of magnitude, strength, and generality dimensions. The results of the descriptive analysis carried out on the self-efficacy variable based on each dimension and aspect can be seen in Table 1.

Based on Table 1, one of the dimensions of self-efficacy that is important for each individual to have is the dimension of magnitude. The average value of the percentage of self-efficacy in literacy and numeracy is 65.63 in the medium category. The magnitude dimension consists of the aspect of being able to overcome the problems encountered, the average percentage value is 60.74 in the medium category and the aspect of being confident in self-efficacy is the average percentage value of 71.75 in the high category.

Overcome the problems encountered, the average percentage value is 60.74 in the medium category and the aspect of being confident in self-efficacy is the average percentage value of 71.75 in the high category.

Table 2 shows the strength dimension obtained the average value of the percentage of self-efficacy in literacy and numeracy of 67.22 in the medium category. The strength dimension consists of the aspect of daring to face challenges, the average value of the percentage is 70.27 with the high category, the aspect of daring to take risks, the average value of the percentage is 73.49 with the high category, and the aspect of realizing one's

Table 1. The percentage value of literacy and numeracy self-efficacy based on the dimension of magnitude

Dimension	Aspect	Percentage of Each Aspect (%)	Average Percentage Value (%)	Category
Magnitude	Able to solve a problem	54.53	65.63	Medium
		64.60		
		60.07		
		53.86		
		60.91		
		57.38		
		64.60		
		58.05		
		67.79		
		65.60		
	Beliefs	74.66		
		66.95		
		60.07		
		71.98		
		73.83		
		68.46		
		82.72		
		75.34		

strengths and weaknesses is the average value of the percentage is 59.89 with medium category.

Table 3 shows generally dimension the average value of the percentage of self-efficacy in literacy and numeracy is 70.42 in the high category. The dimensions generally consist of the aspect of being able to interact with other people, the average value of the percentage is 69.30 in the high category, the tough and not giving up aspect, the average value of the percentage is 71.78 in the high category. The following is a graphic image of self-efficacy literacy and numeracy based on the self-efficacy dimensions of junior high school students in the North Aceh region.

Based on Fig. 1, for the magnitude dimension, the highest value is in the aspect of beliefs, which is 71.75 in the high category. For the Strength dimension, the highest value in the aspect of daring to take risks is 73.49 in the high category, while the Generally, the highest value in the aspect of being tough and not giving up easily is 71.78 with the high category. When viewed from the dimension of self-efficacy, the highest dimension value obtained is the Generally dimension, which is 70.42 in the high category, while the lowest dimension is the Magnitude dimension of 65.63 with the medium category.

Table 2. The percentage value of literacy and numeracy self-efficacy based on the dimension of strength

Dimension	Aspect	Percentage of Each Aspect (%)	Average Percentage Value (%)	Category
Strength	Dare to face challenges	71.14	67.22	Medium
		71.14		
		75.67		
		67.79		
		73.32		
		62.58		
	Dare to take risks	77.18		
		76.68		
		68.62		
		71.48		
	Realizing Your Strengths and Weaknesses	59.40		
		55.37		
		61.41		
		61.74		
		60.23		
		61.74		

The high percentage score in the general aspect shows that junior high school students in the North Aceh region have a fairly high level of confidence in completing or carrying out assignments. The generality dimension relates to the individual's mastery of the field or task being carried out (Bandura A, 1997). In other words, junior high school students in the North Aceh region have high enough self-efficacy so that they will be able to complete tasks in the field of reading literacy and numeracy. Self-efficacy is an individual's ability to perform academic tasks [12].

This is in line with research conducted [13] which states that self-efficacy has a positive and significant relationship to scientific literacy ability. Self-efficacy affects students' literacy skills. Literacy skills are very important and need to be applied in learning as an implication of obtaining good literacy skills [14]. Students who have high enough self-efficacy have a tough attitude and do not give up easily and can interact with others so that they can complete tasks well [15].

Self-efficacy on the strength dimension is in the high category indicating that junior high school students in the North Aceh region dare to face challenges, dare to take risks, and are aware of their strengths and weaknesses that affect students' literacy abilities, especially reading and numeracy literacy. In line with research conducted by Deniz Kaya, Huseyin Cihan Bozdag [16] stated that mathematics self-efficacy and perceptions of science self-efficacy were found to be correlated and have a significant effect on

Table 3. The percentage value of literacy and numeracy self-efficacy based on the dimension of generally

Dimension	Aspect	Percentage of Each Aspect (%)	Average Percentage Value (%)	Category
Generality	Able to interact with other people	65.94	70.42	high
		68.79		
		69.97		
		63.42		
		74.16		
		73.49		
	Tough and not easily give up	68.29		
		74.33		
		77.01		
		67.79		
		71.48		
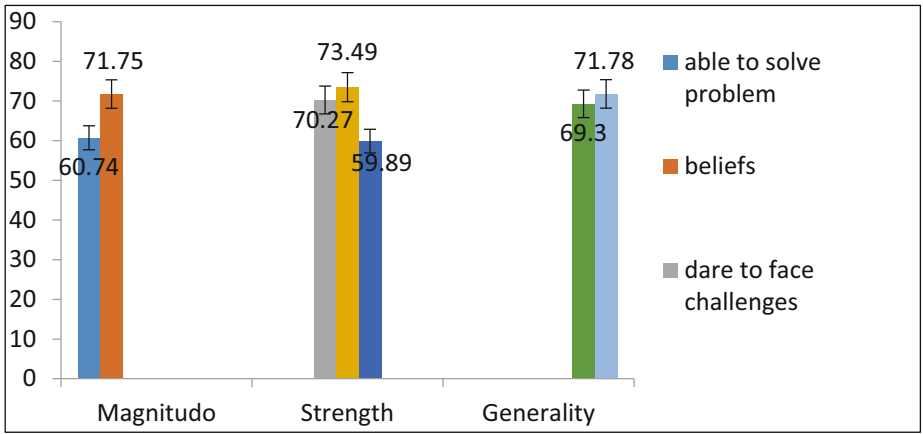
Fig. 1. Graph of self-efficacy dimensions of literacy and numeracy for each aspect

academic achievement at high, medium, and low levels. Self-efficacy is one of the most important factors in influencing students' numeracy literacy. If students do not have strong self-efficacy in numeracy literacy, students are not interested in pursuing goals or completing assignments [17].

The lowest percentage value in the magnitude dimension. This shows that junior high school students in the North Aceh region have low abilities based on the degree of difficulty of the task. The concept in the magnitude dimension lies in a person's belief in his ability to the level of task difficulty. A person's belief is limited to easy tasks,

moderate to the most difficult tasks according to the individual's ability limit. Thus, the higher the level of difficulty of the task, the weaker the confidence to complete it. [18] stated that students who have self-efficacy skills with low and medium categories require teachers to motivate so that students can be more confident in their skills to use ideas so that they are more optimal in solving problems.

The level of student self-efficacy is influenced by the nature of the task faced by the individual, the external incentives received by the individual from others, the status or role of the individual in his environment, and information about self-ability. Different self-efficacy in different situations depends on the abilities demanded by different situations, the presence of other people as well as physiological and emotional states.

Each individual has self-efficacy with different dimensions [19]. Students who have self-efficacy with a good magnitude dimension are not necessarily good in the strength and general dimensions. Therefore, teachers must be able to train students in three dimensions to optimize self-efficacy. One of the efforts that can be done to increase students' self-efficacy is to provide motivation, provide performance experiences, eliminate emotional attitudes, and use the right learning approach.

4 Conclusion

Based on the results and discussion, it can be concluded that the self-efficacy of junior high school students in the Aceh region based on the magnitude dimension obtained an average percentage value of 65.63 in the medium category. Self-efficacy based on the strength dimension obtained an average percentage value of 67.22 with a medium category. Self-efficacy based on the strength dimension obtained an average percentage value of 70.42 with a high category. The level of self-efficacy in each dimension is different, therefore optimization is needed to improve the level of student self-efficacy. One of the ways is through strengthening-literacy and numeracy skills.

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