Relationship between Curiosity and Intrinsic Motivation for Science Process Skills

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Abstract: This research aims to analyze (i) the initial curiosity, motivation, and science process skills of students (ii) the relationship between curiosity and science process skills; (iii) the relationship between intrinsic motivation and science process skills; and (iv) the relationship between curiosity and intrinsic motivation toward science process skills.The subject in this study is students of 7th grade An-Nizam Junior High School Medan. This type of research is quantitative descriptive. Data about the curiosity, intrinsic motivation and science process skills were collected by test and nontest instruments. This research was analyzed by using linear regression. The results showed that the intrinsic motivation and curiosity of An-Nizam students are already in the high category but students' science process skills are still low. There is no significant relationship between curiosity and science process skills (0.478 > 0.05), intrinsic motivation and science process skills (0.910 > 0.05) and curiosity and intrinsic motivation toward science process skills (0.673> 0.05).

1 INTRODUCTION

Education is essentially a conscious effort to develop personality and abilities within and outside the school(Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System). Education plays an important role in improving the quality of human resources that support the progress of development.

Students are resources that have the fundamentals of potential that need to be developed through education. All students basically want to succeed in the learning process, but to achieve good results, students find barriers that lead to failure in achieving learning goals. Therefore, to achieve the desired learning results, it is necessary to see some factors that students have.

According to Ahmadi(Ahmadi,2005), the factors that influence learning can be classified into two parts, namely internal and external factors. Internal factors are those that come from students.The following are included in the internal factors such as intelligence, physical factors or physiological factors, attitudes, interests, talents, and intelligence. While external factors cover social and environmental factors nonsocial.In addition, Slameto (Slameto,2013) states that external factors that can affect learning are the family environment, school environment, and community environment. Internal and external factors significantly influence student's achievement. One of the most influential factors is the curiosity and motivation factor.

The curiosity and motivation of a student is an internal factor affecting the learning process in the classroom. The curiosity is the initial asset for students in the learning process. The curiosity will encourage students to fulfill their motivation. In order to fulfill his curiosity, the students will go into the process of searching. The curiosity is a character that comes from the processing of the mind (Samani, dkk, 2012, p. 25). The curiosity makes students more sensitive in observing the various phenomena or events around them, and will open up challenging new worlds and attract them to learn more deeply. Sulistyowati (Sulistyowati,2012, p. 74) argues that curiosity is the attitude and action that always try to know more deeply and wider than what is learned, seen, and heard.

Mustari (Mustari,2011, p. 109) argues that to develop curiosity in children, the freedom of the child itself must exist to perform and serve his curiosity. One cannot simply rebuke somebody else

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who does not know or is lazy when asked or asking. Findings from the psychology of curiosity can be profitably employed to guide teaching practice, in a range of educational contexts, to motivate students to seek information (Pluck and Johnson,2011, p. 29).

In addition to curiosity, the intrinsic motivation of a student is also an important factor in learning. Motivation is a dominant factor in influencing the learning process. Motivation is the main factor driving someone to do something. Therefore, motivation is a factor that influences student to involveactively in learning. Motivation is a complex part of human psychology and behavior that influences how individuals choose to invest their time, how much energy they exert in any given task, how they think and feel about the task, and how long they persist at the task (Bakar, 2014). The motivation of students in science learning is a point as supporting conditions to the central dogma of academic performance and critical thinking in school science. Moreover, motivation refers to reasons that underlie behavior that is characterized by the students' interests, willingness, and volition (Beal and Stevens, 2011).According to Ryan and Deci (Ryan and Deci,2000), intrinsic motivation is defined as doing an activity for its inherent satisfaction rather than for some separable consequence. When intrinsically motivated, a person is moved to act for the external challenge, pressures or rewards.

The Intrinsic motivation can be stronger if given outside encouragement. In the learning process, if the students perceive the task as something interesting, relevant personally, meaningfully, and at a level appropriate to the student's abilities, they think they can succeed in completing the task. The intrinsic motivation will also strengthen if the task is connected to by the real world and students have control over the task. Teachers support students' intrinsic motivation by increasing their curiosity and being sensitive to individual differences in motivating students (Santrock, 2013).The function of intrinsic motivation for students is to encourage student learning behavior, influence student learning achievement, build learning that is more meaningful and motivate the achievement of student learning goals.

The factors of curiosity and motivation are equally important factors in achieving the expected learning outcomes, one of which is the mastery of science process skills. Scientific process skills are the result of learning in the form of scientific work skills. Abungu (Abungu,2014) states that process skills are the centers for procurement of the scientific knowledge that is useful for solving problems in society. Therefore, the development and improvement of students' process skills become matters of importance for the teacher to do for the attainment of learning objectives.Scientific process skills can also be interpreted as an insight or development of intellectual, social, and physical skills derived from the fundamental ability that in principle exists in the learner (Dimyati and Mudjiono, 2006, p. 138).When learners interact in the world of science, they find their own research through the question, hypothesis, prediction, investigation, interpretation, and communication stages and these are what are called science process skills (Ash, 1998).Process skills could be developed through direct experiences as learning experience (Rustaman, 2005).

Rezba et al. (Rezba et al.2007) said that science process skills could be divided into two groups, namely the basic skills and the integrated skills. The basic skills consist of the observation, communication, classification, measurement, temporary/tentative/initial conclusion (or inference), and prediction skills. The integrated skills consist of the variable identification, table making, graph making, inter-variable relation description, data elicitation and processing, investigation analysis, hypothesis construction, variable operational definition, and investigation and experiment design skill.

All of the science process skills cannot be instantly mastered by students. They takes a process of habituation and practice.Creating and setting learning habits that can grow process skills in learners will not be easy.Habits are only possible through persistent processes, and sacrifices accompanied by ongoing training for consistent repetition.It is so difficult to build positive habits because every habit must be driven by an understanding of knowledge and capable of benefit from the behavior.

Therefore, the factor from within the student is an important part to assist the process of habituation, such as curiosity and intrinsic motivation of student so that the student process skills can be mastered properly.

This study was conducted to see the early interest and intrinsic motivation as well as its relationship with students' science process skills because basically the success or failure of learning depends not only on external but also internal factors; both factors are equally important.

2 METHODS

The method of research in this study is quantitative descriptive. This method provides a description of the variables to be studied and investigate the relationship between variables, among them is the relationship between the variables of curiosity and intrinsic motivation with sains process skills.

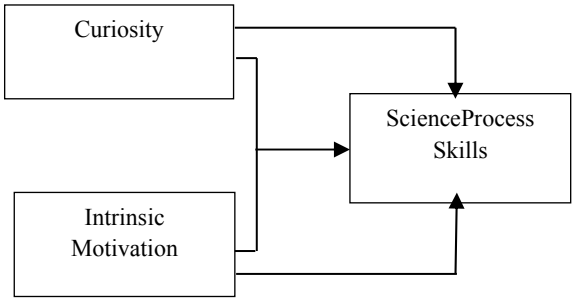

Figure 1: Design of research method.

The study was conducted at AN-Nizam junior high school Medan. The subjects of the study were students of 7th grades. The Technique of collecting the data was done by a technique of test and nontest. Science process skills are using test instrument for data collection, while nontest technique is using instrument in the form of the question to reveal data about curiosity and intrinsic motivation.

3 RESULTS AND DISCUSSION

3.1 Results

Based on the data analysis obtained, the results ca be described as the following:

a. Curiosity (X1)

The curiosity obtained from the questionnaire is shown in Figure2.

Based on Figure 2, it can be seen that students who have high curiosity are 52, medium curiousity 34, and low curiousity 0. It indicates that the curiosity of An-Nizam's students in this initial study is essentially excellent.

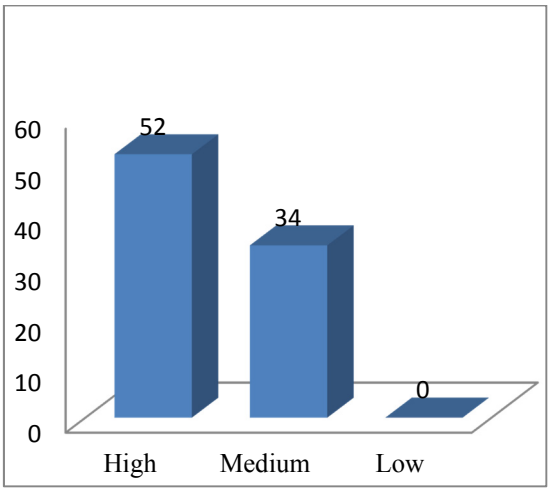

Figure 2: The curiosity students with high, medium, and low criteria.

b. Intrinsic Motivation (X2)

The curiosity obtained from the questionnaire is shown in the Figure 3..

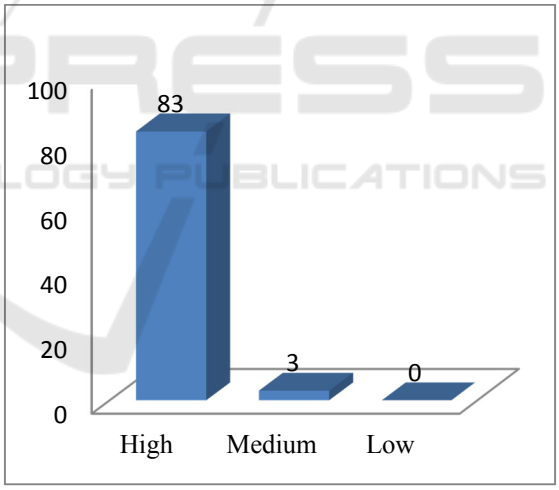

Figure 3: The intrinsic motivation students with high, medium and low criteria.

Based on Figure 3, it can be seen that the students who havehigh intrinsic motivation are 83, medium intrinsic motivation3, and low intrinsic motivation 0. It indicates that the intrinsic motivation of An-nizam's students in this initial study is essentially excellent.

c. Science Process Skills (Y)

The sains process skills obtained test is shown in Figure 4.

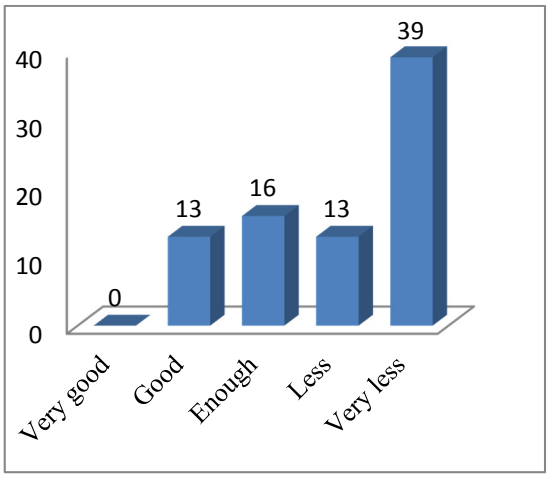

Figure 4: The science process skills students with some criteria.

Based on figure 4, it can be seen that students who have science process skill with a very good category are 0. Students who have good category are 13 and enough category 16. Students who have a low category are 39. This indicates that science process skills of An-nizam's students in the initial study were low.

The results obtained were to find out the linear relationship of curiosity (X1) and intrinsic motivation (X2) towards scientific process skills (Y) by conducting a linear regression test. The results of the analysis with the SPSS assistance program for several variables can be seen in Table 1 and Table 2.

Table 1:Table of Significance of Curiosity and Intrinsic Motivation.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.8	26.54		.85	.393
	Curiosity	.262	.367	.092	.71	.478
	Motivation	.027	.237	.015	.11	.910

Table 1 shows the significant value for the curiosity of 0.478 (p> 0.05) so that the hypothesis is rejected. It means that the curiosity variables have no significant effect on the science process skills. Furthermore, for intrinsic motivation variables, the above data shows a significant value of 0.910 (p>0.05); therefore, the hypothesis is rejected. It means that intrinsic motivation variables also have no effect on the science process skill.

Table 2: Table of Significance of Curiosity and Intrinsic Motivation toward Science Process Skills.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	405.661	2	202.830	.398	.673[a]
	Residual	39720.882	78	509.242		
	Total	40126.543	80			

Table 2 shows the significant value of 0.673 (p> 0.05). It can be concluded that the hypothesis is rejected. It means that the variables of curiosity and intrinsic motivation have no significant effect simultaneously on the science process skills.

3.2 Discussion

Based on the results, it has been found that the motivation and curiosity of the students in this initial study are in the high category. This can give a good influence in the learning process because the success or failure of a learning can be influenced by factors from within the students. As revealed by Syah (2006), there are several factors that affect the learning achievement of internal factors and external factors. Internal factors consist of physical and psychological aspects (talents, attitudes, habits, interests, motivation, and intelligence); External factors consist of the social environment and nonsocial environment.

The high curiosity and high motivation in this initial study were not in line with the value of students' science process skills. This can be seen that there is no significant relationship between the curiosity and science process skills (0,478> 0,005),intrinsic motivation and science process skills (0.910> 0.05) and curiosity and motivation toward students' science process skills (0.673> 0.05). This is

because the science process skills are still quite foreign to the students so that they feel unfamiliar in doing tests related to the science process skills. In addition, students are still rarely given lessons that can improve the science process skills, though science process skills are skills that need to be trained to start from the basic level. This is in accordance with the claim proposed by Padilla & Okey (1984) who state that science process skills need to be strongly emphasized in elementary, middle, and secondary science curricula and classrooms.

The findings of this initial study suggest that there should be still a need to familiarize learning that can improve the science process skills. In addition, the curiosity and high motivation of students can be a positive thing for the implementation of a good learning process in the future.

4 CONCLUSION

Based on the foregoing results, the following are concluded: (1) The intrinsic motivation and curiosity of An-Nizam students are already in the high categorybut students' science process skills are still low, (2) There is no significant relationship between curiosity andscience process skills, (3) There is no significant relationship between intrinsic motivation andscience process skills and (4) There is no significant relationship between curiosity and intrinsic motivation toward science process skills.

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