



Instrument Preparation The Effect of SETS Approach-Based Learning on Students' Learning Motivation

Siti Sarah, Siti Maria Ulfah, Sendy Firdiasari Yusuf,
Joko Suprapanto and Teofilus Ardian Hopeman

EasyChair preprints are intended for rapid dissemination of research results and are integrated with the rest of EasyChair.

September 3, 2022

Instrument Preparation The Effect of SETS Approach-Based Learning on Students' Learning Motivation

Siti Sarah^{1,*} Siti Maria Ulfah^{2,*} Sendy Firdiasari Yusuf^{3,*} Joko Suprapmanto⁴,
Teofilus Ardian Hopeman⁵

¹Nusa Putra University

²Nusa Putra University

³Nusa Putra University

⁴Nusa Putra University

⁵Dong Hwa University

Corresponding author *E-mail: sendy.firdiasari_pgsd19@nusaputra.ac.id, siti.maria_pgsd19@nusaputra.ac.id,
siti.sarah_pgsd19@nusaputra.ac.id, joko.suprapmanto@nusaputra.ac.id, 610688119@gms.ndhu.edu.tw

ABSTRACT

SETS can make students aware that technology affects the rate of growth of science, as well as its impact on the environment and society, with SETS students become more interested in studying learning material because it is associated with real things in everyday life, thus gaining a deep understanding of knowledge which is owned. In SETS learning, there is an expectation that in utilizing science for the benefit of society, including in the form of technology, it is hoped that its practices and products will not damage or harm the environment and society itself. SETS-based learning requires educators and students to explore all the possibilities that can occur in the interrelationships between the concepts being studied and their effects on the learning process. From this research.

Keywords: SETS, methods, approaches, learning, science.

1. INTRODUCTION

Learning is a process of interaction between students and educators and learning resources in a learning environment. Learning is assistance provided by educators so that the process of acquiring knowledge and knowledge, mastering skills and character, and forming attitudes and beliefs in students can occur. Learning is a process to help students learn well. Learning in the context of education, educators teach so that students can learn and master the content of the lesson to achieve a specified objective, it can also affect changes in attitudes and skills of a student, but this teaching process gives the

impression that it is only the work of one party, namely work. teacher only. Learning implies an interaction between teachers and students.

Permendikbud No. 22 of 2016 states that the learning process in educational units is held interactively, inspiring, fun, challenging, motivating students to participate actively, and providing sufficient space for initiative, creativity, and independence in accordance with talents, interests, and physical and psychological development. learners. Quality learning is highly dependent on student motivation and teacher creativity. Learners who have high motivation supported by teachers who are able to facilitate this motivation will

lead to the successful achievement of learning targets. Learning motivation means encouragement to achieve learning goals, such as understanding the material or developing learning.

The learning process in students is not as strong, there are students whose motivation is intrinsic where their willingness to learn is stronger and does not depend on factors outside themselves. In contrast to students whose learning motivation is extrinsic, the willingness to learn is highly dependent on conditions outside of themselves. However, in reality, extrinsic motivation is what happens a lot, especially to children and adolescents in the learning process.

Many learning models can be applied as a solution to increase student motivation, one of which is SETS. SETS vision learning, students are invited to link between elements of science in learning that is being followed by elements of the environment, technology and society. (Atminiati & Binadja, 2017) SETS learning also helps students in utilizing the school environment to obtain information based on the material being studied, students use the environment around the school to observe objects around the school.

Students can use the community to interact in finding information, so students are not only taught to use the environment to obtain information but also use the community to obtain information. And students can apply the theory learned with existing technology.

SETS education will essentially guide students to think globally and act locally and globally in solving problems they face on a daily basis. Problems that exist in society are brought into the classroom to find solutions using SETS education in an integrated manner in the reciprocal relationship between elements of science, environment, technology, society.

Students are trained to be able to think globally in solving local, national and international problems according to their level of thinking and reasoning abilities. Learners are guided to have sensitivity to problems in society and play an active role to participate

in finding solutions. This SETS approach can overcome the weakness of the classical education system where students are invited to go ahead to complete the subject matter, without clearly knowing the students' implementation of the absorption of the subject matter (whether the subject matter can be mastered in whole or in part, and what basic competencies have been achieved).

Considering that science learning is now not only oriented to the development of science and technology, but also must understand the values contained therein. Based on the description that has been described, it is necessary to conduct research to find out whether there is an influence that arises or is owned by students in learning, so that students are able to implement the material obtained in real life.

2. THEORY STUDY

2.1 Learning

Learning is an activity that involves a person to acquire knowledge, skills, and positive values that can be used in everyday life. Learning involves two parties, namely educators as facilitators and students as learners.

According to Permendikbud Number 103 of 2014 concerning Learning in Primary and Secondary Education states that learning is a process of interaction between students and between students and educators and learning resources in a learning environment. Learning is a process of developing the potential and character building of each student as a result of the synergy between education that takes place in schools, families and communities.

This process provides opportunities for students to develop their potential into abilities that are increasingly increasing in attitudes (spiritual and social), knowledge, and skills needed for life and for society, nation, and contribute to the welfare of human life. Learning is aimed at developing the potential of students to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative, and affective, and able

to contribute to the life of society, nation, state, and world civilization. In order for students to actively participate, have creativity, and independence in accordance with their talents, interests and physical and psychological development of students, motivation is needed.

2.2 Learning Motivation

Motivation comes from the word motive, which is a condition within the individual that encourages individuals to carry out certain activities, whether consciously or not, to achieve certain goals (Winarni, Anjariah, & Romas, 2016). Motivation can be in the form of attitudes or values that influence individuals to achieve specific things according to the goals that the individual wants to achieve. These attitudes and values are a force that provides strength to encourage individuals to achieve goals.

Even the motive can be interpreted as an internal condition (readiness). Changes in energy in a person which is characterized by the emergence of feeling and preceded by a stimulus to achieve a goal. In learning activities, motivation can be said as the overall driving force in students that creates, ensures continuity and provides direction for learning activities, so that the expected goals can be achieved. In learning activities, motivation is needed, because someone who does not have motivation in learning will not be able to carry out learning activities.

Learning motivation can be interpreted as a driving force to carry out certain learning activities that come from within and also from outside the individual so as to foster enthusiasm in learning (Monika & Adman, 2017). Learning motivation arises from within and from outside students to achieve learning objectives. This motivation includes the desire and desire to succeed, the encouragement of the need to learn, and the hope for the ideals that students want to achieve.

Learning motivation has a big role in the success of a student. Learning outcomes will be optimal if there is motivation to learn. The more precise the motivation given, the better the learning outcomes. Thus, motivation

always determines the intensity of the learning effort for students (Bakar, 2014). Learning motivation is very important in learning activities, because the motivation to encourage the spirit of learning and conversely the lack of motivation to learn will weaken the motivation of students.

The essence of learning motivation is internal and external encouragement to students who are learning to make changes in behavior, generally with several indicators or supporting elements.

Hamzah B. Uno (2011:23) indicators of learning motivation can be classified as follows:

1. There is a desire and desire to succeed
2. There is a drive and a need for learning
3. There are hopes and aspirations for the future
4. There is an appreciation in learning
5. There are interesting activities in learning
6. The existence of a conducive environment, allowing a student to learn well.

According to Sardiman AM (2011:83) indicators of learning motivation are as follows:

1. Persevere in the face of the task
2. Tenacious in the face of adversity (not easily satisfied)
3. Shows interest in various issues for adults (e.g. development issues, politics, economics, etc.)
4. Prefer to work independently
5. Gets bored quickly with routine things (things that just repeat themselves)
6. Can defend his opinion.

Furthermore, Martin Handoko (in Herlin Febrina, 2011) indicators of learning motivation are:

1. Strong will to learn
2. The amount of time allotted to study
3. Willingness to leave other obligations or duties.
4. Perseverance in doing the task.

From the various expert opinions above, the indicators and characteristics of learning motivation can be classified as follows:

1. Strong will to do

2. Perseverance in doing the task
3. The amount of time devoted to studying
4. Tenacious to face difficulties (not easily satisfied)
5. Willingness to leave other obligations or duties
6. There are hopes and aspirations for the future
7. Prefer to work alone

2.3 SETS Learning Model

SETS vision learning, students are invited to link between elements of science in learning that are being followed by elements of the environment, technology and society. (Atminiati & Binadja, 2017) SETS learning also helps students in utilizing the school environment to obtain information based on the material being studied, participants Students use the environment around the school to observe objects around the school.

The advantages of the SETS learning model can train students to do scientific work methods. So that students are able to make scientific works that are well organized and organized. Improve students' ability to communicate. Make learning fun. Helping students recognize and understand science and technology as well as the negative impacts that can be caused in everyday life. (Wahdah et al., 2017)

The SETS learning model has advantages according to Fatchan (2014) as follows. (a) Can improve inquiry skills, solving skills, and process skills, emphasizing good learning methods that include cognitive, affective and psychomotor domains, emphasizing science in integration and between fields of study, (b) From a learning perspective, emphasizing student success, can be combined with various learning strategies, make the teacher aware that sometimes he does not always function as a source of information, (c) If viewed from an evaluation perspective there is a relationship between goals, processes and learning outcomes, differences between skills, maturity and student backgrounds and program functionality is also evaluated. SETS itself has the impact of making students make the ability to see things with the four elements contained in SETS. Using the SETS learning model, students are asked to think

more critically so as to hone children's thinking patterns in learning. The characteristics of the SETS approach are as follows:

- a. Teachers continue to teach science.
- b. Students are brought into situations to utilize the concept of science in the form of technology for the benefit of society.
- c. Students are asked to think about the various possible consequences that occur in the process of transferring science into technology.
- d. Students are asked to explain the relationship between the elements of science that are discussed with other elements in SETS that affect the various interrelationships between these elements.
- e. Students are brought to consider the benefits or disadvantages of using the scientific concept when it is converted into technology.
- f. In constructivism, students can be invited to talk about SETS from various starting points depending on the basic knowledge possessed by the students concerned. (Nono Sutanto in Fahrurruzi (2014))

3. METHODOLOGY

3.1 Research methods

The data collection technique uses a qualitative approach. The method used is literature study. The characteristics of this method also make humans the subject of collecting data. This type of research is an experimental scale. Experimental research is research conducted to determine the effect of giving a treatment or treatment to research subjects. The research design used is a quasi experiment. There are two variables in this study, namely the independent variable and the dependent variable. The independent variable is students' learning motivation and the dependent variable is the SETS learning model (Science, Environment, Technology, Society).

The research was conducted at SDN 01 Karangtengah and SDN Sukamanah 03. The population in this study were all 5th grade students at SDN 01 Karangtengah and

SDN Sukamanah 03, totaling 153 consisting of 4 classes. The sample in this study consisted of 2 classes totaling 82 students, namely class 5A at SDN 01 Karangtengah which amounted to 37 students as the experimental class. Class 5 at SDN Sukamanah 03 with 45 students as the control class.

The types of instruments in this study are pre-test and post-test, where each question measures different indicators of student learning motivation. Before the questions are used for research, they are tested for validity, reliability, discriminating power and level of difficulty. Data analysis to test normality, homogeneity and hypotheses. The sampling technique is observation (observation), interview (interview), questionnaire (scale), documentation. The research was carried out by collecting the desired data, the next step was to process the data and analyze the data that had been obtained using the SPSS (Statistical Product and Servicer Solution) version 23.0 for windows program.

4. DISCUSSION RESULTS

This research begins with the preparation of the grid. The grids are arranged according to the criteria derived from the Indicators. The indicators for each variable are as follows:

1. Students have a strong curiosity
2. Students have an attitude of perseverance in doing assignments
3. Students have scheduled time to study
4. Students are tenacious in the face of difficulties (not easily satisfied)
5. Students are willing to leave other obligations or assignments
6. Students have hopes and aspirations for the future
7. Students prefer to work alone.

SETS Learning Indicators are as follows:

- a. Keep emphasizing science as the subject of study.
- b. Students are brought into situations to utilize science concepts to form technology for the benefit of society.

- c. Students are asked to think about the various possible consequences that occur in the process of transferring science into the form of technology.
- d. Students are asked to explain the relationship between the elements of science that are being discussed with the elements in SETS (Science, Environment, Technology and Society) that affect the various relationships between the elements of SETS.
- e. Students are brought to consider the benefits and disadvantages of using the science concept when it is converted into a related technology.
- f. Students can be invited to talk about SETS from various directions and from various basic knowledge possessed by the students concerned.

Based on the indicators, they are organized into a grid as follows:

No	Aspect	Indicator	Statement	
			+	-
1	Enthusiastic in learning Listen to the teacher's explanation	Students have a strong curiosity Students are tenacious in the face of difficulties (not easily satisfied)	I am interested in the topic explained by the teacher I am enthusiastic when I face difficulties in learning I am interested	I ignored what the teacher explained I'm lazy when I face difficulties in learning I'm not excited to find

		There is a desire to explore the learning material	d in further deepening the learning material that has been delivered by the teacher	out what the teacher has said
2	Ask if you don't know	Students are interested in asking	I'm interested in asking questions when I don't understand what the teacher is saying	I act indifferent when I don't understand the teacher's explanation
3	Answering questions posed by teachers or other students	Students are interested in answering questions from the teacher	I am interested in the material presented by the teacher	I don't understand what the teacher said
		Students are interested in answering	I am interested in the questions asked by other students	I don't pay attention to the questions asked by other students

		questions from friends		
4	Doing practice questions quickly	Students have a diligent attitude in doing assignments	I'm diligent when I'm working on problems exercises given by the teacher	I'm lazy when the teacher starts giving practice questions
5	Collaborate with group members	Students are interested in learning that involves collaboration	I am very excited when I study in groups	I'm not interested when studying in groups
		Students are enthusiastic when discussing	I'm interested when I'm discussing with friends and teachers	I am not enthusiastic when discussing with friends or teachers

Based on the grid above, it is then compiled into an instrument of learning motivation. Of the various methods that can be used to assess learning motivation, in developing the learning motivation instrument, the author uses a questionnaire (questionnaire) method. Therefore, the writer must formulate the statement points of the questionnaire.

There are several considerations for choosing a questionnaire as a method of data collection, including: (1) it can collect data from a large number of subjects simultaneously compared to the observation and interview methods; (2) the data collected is more objective than using interviews because respondents can give their responses more freely, without being influenced by the mental attitude of the relationship between the researcher and the research subject, or by the time available in thinking about answers; (3) can collect information related to cognitive and affective processes, which is impossible to obtain through observation; and (4) the data collected is easier to analyze, because the statements written in the questionnaire are fixed and the same between those submitted to one respondent and those submitted to other respondents.

No	Statement	4	3	2	1
1	I'm interested to see what the teacher brings				
2	I ignored what the teacher brought				
3	I'm interested in the teacher's example				
4	I ignore the teacher's example				
5	I take notes on the material given by the teacher				
6	I always concentrate when learning takes place				
7	I always mean it when I take lessons				
8	I am always active in every lesson				
9	I discuss with friends to understand learning				

10	I do group work outside of school with friends				
11	I do assignments according to the teacher's instructions				
12	I always ask the teacher when I have difficulty in learning the material				
13	I feel happy to re-understand difficult questions or material				
14	I like to invite friends to discuss when I find difficulties in learning				
15	I pay close attention to the lessons given by the teacher				
16	I listened to the teacher's explanation from the beginning to the end of the lesson				
17	I complete the practice questions given by the teacher on time				
18	I do the practice questions given by the teacher seriously				
19	I always answer the questions asked by the teacher				
20	I prefer to do assignments with friends				

Motivation can be assessed in various ways such as direct observation, appraisal by others, and self-reports, as the table shows. The table contains various categories of learning motivation. The formulation of the questionnaire was prepared based on statements that had been prepared regarding learning motivation, then used for assessment materials regarding learning motivation.

5. CONCLUSION

Motivation has an important position in achieving the learning objectives that have been set. The emergence of motivation is not solely from the students themselves but teachers must involve themselves to motivate student learning. The existence of motivation will provide enthusiasm so that students will know the direction of learning. Learning motivation can arise if students have a desire to learn. Therefore, both intrinsic and extrinsic motivation must exist in students so that the learning objectives that have been formulated can be achieved optimally.

Various learning innovations can be developed to increase students' learning motivation, one of which is by using the SETS approach. This SETS approach can overcome the weakness of the classical education system where students are invited to go ahead to complete the subject matter, without clearly knowing the students' implementation of the absorption of the subject matter (whether the subject matter can be mastered in whole or in part, and what basic competencies have been achieved). The shortcomings of the SETS approach include: 1) It is difficult to make students associate the 4 elements in SETS. 2) In learning tends to take longer. 3) Can only be applied in the upper class. This research is still compiling instruments, for further validity testing needs to be done.

REFERENCES

- [1] Andriani, R., & Rasto, R. (2019). Learning motivation as a determinant of student learning outcomes. *Journal of Office Management Education (JPManper)*, 4(1), 80-86.
- [2] Khasanah, N. (2015). SETS (Science, Environmental, Technology and Society) as a modern science learning approach in the 2013 curriculum. *Proceedings of Kpsda*, 1(1).
- [3] Masni Hanbeng. (2015). Strategies to Increase Learning Motivation. *Dikdaya*, 5 (1) .
- [4] Martina., Anhariah., Romas. (2016). Learning motivation in terms of parental social support for high school students. *Journal of Psychology*, 2(1).
- [5] Ragil, Z., & Sukiswo, SE (2011). The application of science learning with a sets approach to light material to improve the learning outcomes of fifth grade elementary school students. *Indonesian Journal of Physics Education*, 7 (1).
- [6] Suprihatin, S. (2015). The teacher's efforts in increasing students' learning motivation. *Journal of Economic Education UM Metro*, 3(1), 73-82.
- [7] Tiara, AD (2021). *Development of E-Module Flip Book Maker Based on SETS Approach on Environmental Pollution Materials*. Undergraduate thesis, UIN Raden Intan Lampung.
- [8] Xiangrui Meng. Scalable Simple Random Sampling and Stratified Sampling. LinkedIn Corporation, Mountain View, USA.
- [9] Zahra, M., Wati, W., & Makbuloh, D. (2019). SETS (Science, Environment, Technology, Society) Learning: Its Effect on Science Process Skills. *Indonesian Journal of Science and Mathematics Education*, 2(3), 320-327.
- [10] Zahro, LF (2019). Efforts to increase *mstudent motivation and learning outcomes through the application of the SETS (Science, Environment, Technology and Society) approach in chemistry learning in the material for the reaction rate of class XI MA Miftahul Ulum Weding 2019/2020* (Doctoral dissertation, Doctoral dissertation, UIN Walisongo).