JPPIPA 10(7) (2024)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Analyzing Student's Motivation Towards Science Learning in Junior High School

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Received: February 23, 2024
Revised: May 31, 2024
Accepted: July 25, 2024
Published: July 31, 2024

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DOI: 10.29303/jppipa.v10i7.7297

Abstract: Motivation is one of the factors that influence student learning outcomes, especially science learning. Motivation has an impact on the results of students' learning and must be concerned to enhance student motivation. This research aims to investigate Junior High School students' motivation in science learning. The survey method, which is a quantitative research method, was used in this research. The instrument named Students' Motivation Towards Science Learning Questionnaire (SMTSLQ), and open-ended questions were applied to Junior High School students who studied in Junior High School, West Java, Indonesia. The participants of this research are 1018, with 622 female and 396 male students. The collected data was analyzed with descriptive statistics, then supported by the answers to open-ended questions from the students. The findings showed that the average self-efficacy is 3.38, active learning strategies is 3.83, science learning value is 3.68, performance goal is 2.9, achievement goal is 3.69, and learning environment stimulation is 3.39. The total average is 3.52, which means the students in Junior High School are categorized as having a high level of motivation in science learning. Based on the students' answers to open-ended questions, they are motivated to learn science because science is fun and interesting to learn, and teachers are able to provide experiences from experiments. Meanwhile, students who are not motivated to learn science because science is a complex subject and difficult to understand, and teachers who give a lot of assignments without experimentation.

Keywords: Science learning; Junior High School students; Motivation

Introduction

Students' learning and performance are significantly influenced by motivation (Teppo et al., 2021). Motivation is a complicated psychological concept that aims to explain behavior and effort in various activities (Salih et al., 2016). Enhancing student motivation is one of the most challenging for teachers in the world of education. Motivation plays an important role in education because it pushes students to perform meaningful activities and raises a desire for a lifetime of learning (Cudney & Ezzell, 2017). Motivation has a significant and beneficial impact on a student's performance or academic achievement; students who are highly motivated by learning are more successful in achievement, and vice versa (Raysharie et al., 2023). In formal schools, there are many students and subjects that must be studied by students, one of them is science. The repetitive learning cycle every day at school will have a significant impact on student learning. Students' achievement in science is influenced by their concentration and motivation during the learning process (Satrianti et al., 2024). Students who are motivated to learn science can develop scientific literacy, which includes understanding scientific knowledge, identifying significant questions, drawing evidence-based conclusions, and making judgements about how human activity impacts the natural world (Chan & Norlizah, 2017). Learning about science prepares students for beneficial and meaningful education and leads them to occasions that provide them with a steady energy of curiosity to continue pursuing scientific

How to Cite:
Nuraysha, A. D., Winarno, N., Fadly, W., Hakim, L., & Emiliannur, E. (2024). Analyzing Student's Motivation Towards Science Learning in Junior High School. *Jurnal Penelitian Pendidikan IPA*, *10*(7), 4139–4148. https://doi.org/10.29303/jppipa.v10i7.7297

knowledge (Capunitan et al., 2023). In relevance, students' mental cognition must be shaped toward academic achievement and acquiring essential capacities through science education (Dogomeo & Aliazas, 2022).

Students' motivation to learn science has been greatly researched. Motivation for science learning among gifted elementary students was not substantially connected with logical thinking, IQ performance, IQ verbal, IQ total, or critical thinking scores (Koksal, 2014). Students' losing motivation to learn science is caused by an aspect to a decrease in the importance of achievement objectives by schools and teachers (Vedder-Weiss & Fortus, 2018). In order to enhance students' motivation in science learning, it is important to make a new learning environment. The benefits of maker spaces in schools as learning settings that stimulate students to learn science. It is strongly advised to use these spaces to teach science, allowing students to discover their passion and build a love of learning (Caballero Garcia & Grau Fernandez, 2019). Also, it is crucial to organize classroom learning spaces utilizing the constructivist approach as it enhances students' science performance both directly and indirectly by boosting their interest in science (Hafızoğlu & Yerdelen, 2019).

The previous literature review related to this research focused on students' motivation in comparison with other countries such as Korea. According to Rachmatullah et al. (2018), the interaction among country, gender, and academic degree exerted large outcomes in the students' technology mastering motivation, in addition to the ultimate motivational components. However, this study aims to investigate students' motivation in science learning for junior high school students in Indonesia and investigates the factors that influence students' motivation. Besides that, this study also investigates junior high school students in each dimension that is differentiated according to their grades. This research is beneficial to see the illustration of how the students' motivation in science learning also can be a reference for science teachers to improve learning and teaching in science, how to engage the students, and their participation in science courses. It also contributes to the importance of measuring students' motivation in science learning in school to achieve students' better performance or science learning outcomes. It also contributes to the validity of the developed SMTSLQ.

This study seeks to investigate the students' motivation toward science learning by using the Students' Motivation Towards Science Learning Questionnaire (SMTSLQ) amongst grades, genders, and ages of the students in junior high school. Specifically, this study aims to examine the students' motivation toward science learning and then profile the results of the research in Junior High School. Tuan, Chin, and Sheh (2005), merging constructivist learning and motivation theories, identified six significant criteria for motivation in science learning motivation which are self-efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment stimulation. This research can be used as a reference for science teachers to avoid or increase the teaching and learning skills or style for the students to increase students' motivation level toward science learning. This research can also be used as a reference for all stakeholders involved in science education, especially science teachers, to improve science teaching and learning for students. The findings will answer the following research questions and hypotheses:

1. How is student's motivation toward science learning in junior high school?
2. Is there a significant difference between grades 7, 8, and 9 in students' motivation towards science learning?

Method

Research Design

This study uses a survey method. The purpose of a survey is to collect data from a sample or the entire population to provide an overview of the population's attitudes, beliefs, behaviors, or characteristics, and then statistically analyze the data to explain trends in answer to questions and evaluate research questions (Creswell, 2012). This study was carried out by providing online satisfaction questionnaires to participants via Google Forms, which could be completed at any time and from any location. The students were instructed to answer the form truthfully based on their perceptions or motivation in science learning. Students were informed that their perceptions did not influence the evaluation of academic progress.

Participants

Table 1. The population and gender balance of the student sample

Grade	Gender	Number	%
7	Female	213	21
	Male	141	14
	Total	354	35
8	Female	259	25
	Male	166	16
	Total	425	42
9	Female	150	15
	Male	89	9
	Total	239	23
Total	Female	622	61
	Male	396	39
	Total	1018	100

The participants of the study consisted of 1018 Indonesian junior high school students in West Java

from 354 Grade 7, 425 Grade 8, and 239 Grade 9, with 396 male students and 622 female students in the range of ages between 12 and 18. They are spread across 20 different schools and 7 different cities and or districts. This study followed convenient sampling. The frequencies of the sample can be seen in Table 1.

Research Instrument

The instrument used in this study was a student motivation questionnaire called the Students' Motivation Towards Science Learning Questionnaire (SMTSLQ) (Tuan et al., 2005). The Cronbach alpha for the overall questionnaire was 0.89, with alpha ranging from 0.70 to 0.89 for each scale. The instrument consists of 35 statements. All these statements are divided into 6 factors such as self-efficacy, active learning strategies, science learning values, performance goals, achievement goals, and learning environment stimulation.

Data Analysis

The questionnaire in this study has a scale for each statement, including five possible responses (strongly disagree, disagree, undecided, agree, and strongly agree) and two scores for the statements, which are positive and negative. The revisited version of the SMTSLQ scale incorporated scoring for items in each factor. The data was analyzed by calculating the average of the total all of the grades (1.00-1.50 = very low, 1.51-2.50 = low, 2.51-3.50 = moderate, 3.51-4.50 = high, 4.51-5.00 = very high) (Wang & Shen, 2023) and also on the Statistical Package for the Social Sciences (SPSS) v. 25. Serials average, one of approximate value assigning methods for lost data in SPSS, was employed. The value of .05 was considered as the significance level in interpreting the results. Firstly, incomplete data and normality were examined, and the data was organized. The data did not have a normal distribution according to the groups; therefore, non-parametric tests were used in the analysis of the data. The Kruskal-Wallis Test was used to examine data to determine whether there are significant variations in students' mean scores for motivation in science learning based on grade level (grade as the grouping variable; mean scores as the test variable).

Result and Discussion

Findings Related to Research Question 1 "How is student's motivation toward science learning in junior high school?"

This study aims to investigate the profile of students' motivation toward science learning in Junior High School based on the SMTSL questionnaire survey. The result in Figure 1 showed that the active learning strategies factor has the highest average, which is 3.83, and the performance goal factor has the lowest average 2.9. There have been several studies regarding the relationship between actives learning strategies and performance goals in science. According to Aji and Khan (2019) showed that active-learning has an positive impact on students' performance-goal. In other research, it showed that the experimental group had better academic performance and higher learning ability than the control group, which means that active learning strategies improved students' academic achievement and learning ability in science class (Aykan & Dursun, 2022).

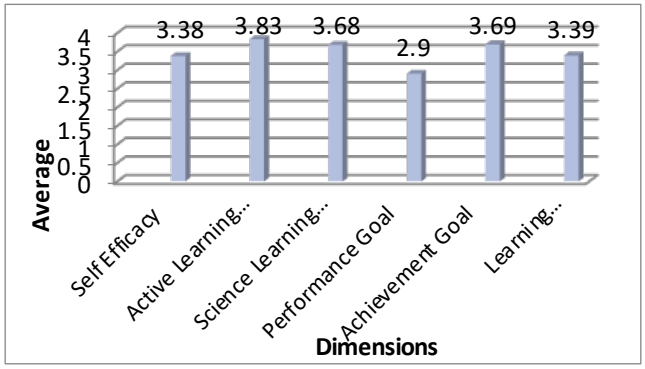

Figure 1. Students' motivation towards science learning in Junior High School based on SMTSL Questionnaire

Based on previous research, it was found that active learning strategies and performance goals have a positive relationship according to educational research. This finding of research is related to the results of (Sabanal et al., 2023) showed that active learning strategies have a highest value and performance goals have a lowest value. This relates to the type of students' intrinsic and extrinsic motivation, active learning strategies is the type of intrinsic motivation and performance goals is the type of extrinsic motivation (Leong et al., 2018). This means that students like learning and doing activities in science classes for their own sake, rather than because of external factors like rewards and punishments (Gottfried, 2019). Higher academic intrinsic motivation tends to be beneficial, as it is connected with a variety of outcomes (Gottfried, 2019). As a result, a student with more intrinsic motivation tends to have a higher perception of competence and lower levels of academic anxiety. Additionally, students with higher levels of intrinsic drive are more likely to become deep-level learners who employ high-order cognitive strategies (Kwarikunda et al., 2022). According to Tuan et al. (2005), performance goal indicates students are motivated to learn science in order to compete with other students, achieve good grades, and attract the attention of their teachers. Thus, this might imply that students do not typically relate their motivation for learning science to the reasons listed before (Sabanal et al., 2023).

Open-ended questions were applied in this research, and students' opinions on what motivates and

does not motivate them to learn science are presented below.

Question 1: *What motivates you to learn science? Please explain.*

Students 1: *Science is very fun and interesting to learn. Many things can be explained through science. I can learn science in my daily life, and I can do many fun practices and experiments. Through science, I can understand natural phenomena around me that I did not know before why it happened. Therefore, I want to be able to understand science so that I can understand the environment around me and get closer to nature. Moreover, I also have an ambition related to science, which is to become a doctor, so I must be able to understand science.*

Students 2: *In school, science is a compulsory subject. Studying science is both easy and difficult. I want to get good grades in science. I like teachers who are kind, fun, and not boring, and who can explain material that is easy to understand and not long-winded so that I can learn science easily and understand quickly. I also like a patient teacher who does not put a lot of pressure on me.*

According to the students' opinions, student 1 showed an internal factor that comes out from that the student wants to be able to understand science, while student 2 showed an external factor that the student would be able to get a high score in science because of the teacher who teaches kindly and patient.

Question 2: *What doesn't motivate you to learn science? Please explain.*

Students 1: *In my opinion, most science materials are difficult to understand. Science encompasses many theories and formulas that I need to understand. This makes me unmotivated to study science. Especially when there are so many theories and formulas that I have to memorize without any practice. It puts pressure on me.*

Students 2: *I agree that science is fun and interesting. However, one of the things that makes me unmotivated to learn science is when science is just a task that I have to do. Teachers who only give me science assignments with monotone learning methods make me no longer interested in science.*

When the opinions of the science learning were analyzed by giving those two questions to the students, it can be seen that the students gave two factors, internal and external factors. Motivation that comes out from the students' thinking and feeling about science are included in the internal factor, while motivation that is caused by others, which is the teacher or the method of teaching and learning, is included in the external factor.

SMTSLQ is divided into six factors: self-efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment stimulation. Each factor consisted of a different number of statements. The profiling of students' motivation towards science learning in Junior High School based on the SMTSL questionnaire survey in each factor: self-efficacy listed in table 2, active learning strategies in table 3, science learning value on table 4, performance goal on table 5, achievement goal on table 6 and learning environment stimulation on table 7.

Table 2. Descriptive statistics for participants' SMTSLQ scores in self-efficacy factor

Items	N	Mean	SD
SE1	1018	3.34	0.83
SE2	1018	2.89	1.07
SE3	1018	3.65	0.99
SE4	1018	3.65	1.15
SE5	1018	2.93	1.15
SE6	1018	3.49	1.08
SE7	1018	3.73	1.09
AVERAGE		3.38	1.09

Table 2 shows the average and standard deviation of students' motivation toward science learning in Junior High School according to the self-efficacy factor. Table 2 shows that the average of self-efficacy is 3.38. It is observed that SE3, SE4, SE6, and SE7 are above average. Junior High School students believe that they can do well and try to understand science courses. Participant students stated that they were willing to get good science scores. They also stated that they were struggling to learn science courses to understand the content of science itself. Not a few also participant students believe they can do the science test because they like science. The items coded SE1, SE2, and SE5 are found to be below the average of science items. Junior High School students feel that science content is difficult, but they still try to pass the science test. Mostly, participant students stated that science content is difficult and they are not confident about their understanding of science, but they also stated that they thought they should understand science and were sure that they could do well in it. According to Ernawati et al. (2021) self-efficacy is an individual's belief in their ability to achieve their goals. Also Schunk and DiBenedetto stated (2021) that self-efficacy is an important internal motivational process that can be affected by personal and environmental factors and influences motivational outcomes related to decisions, effort, persistence, and achievement. Students with high self-efficacy believe they can understand

science knowledge, despite its difficulty (Sabanal et al., 2023).

Table 3. Descriptive statistics for participants' SMTSLQ scores in active learning strategies factor

Items	N	Mean	SD
ALS1	1018	4.05	0.88
ALS2	1018	3.63	0.86
ALS3	1018	3.59	0.82
ALS4	1018	4.08	0.92
ALS5	1018	3.66	0.83
ALS6	1018	4.01	0.83
ALS7	1018	3.90	0.85
ALS8	1018	3.69	0.87
AVERAGE		3.83	0.86

Table 3 shows the average and standard deviation of students' motivation toward science learning in Junior High School according to the active learning strategies factor. Table 3 shows that the average of active learning strategies is 3.83. It is observed that ALS1, ALS4, ALS6, and ALS7 are above average. Junior High School students were trying to understand the concept of science, and they try to find out the right concept from the teacher or their friend clarification. They stated that the teacher has an important role in delivering the concept of science, not only giving the material and assignment to the students. They also stated that they were able to understand science if they understood the concept, especially in the field that they like, they stated mostly they like biology because it learns a lot of things about nature. The items coded ALS2, ALS3, ALS5, and ALS8 are found to be below the average of science items. Junior high school students believe that science concepts are important; they learn a lot about nature and living things. Also, they stated that science is interesting to learn, but they feel they do not have enough concepts about the science concept itself. If they lack understanding of concepts in science, this must be cleared by the teacher. Students become active learners, employing learning strategies to construct new knowledge based on prior knowledge. Based on students' statements, this implies that teachers have an important role as providers of knowledge or concepts for students as stated by Theobald et al. (2020) that active learning strategies include structured activities that foster student engagement, and the teacher's role involves that of a knowledge provider. The constructivist theory of learning, which underlies active learning, believes learners create their knowledge through interactions with their environment and experiences (Kovarik et al., 2022). Students can collaborate with friends to learn science and engage in hands-on activities (Cascolan, 2023; Lombardi et al., 2021; Owens et al., 2020).

Table 4. Descriptive statistics for participants' SMTSLQ scores in science learning value factor

Items	N	Mean	SD
SLV1	1018	3.87	0.93
SLV2	1018	3.62	0.92
SLV3	1018	3.61	0.89
SLV4	1018	3.51	0.92
SLV5	1018	3.77	0.85
AVERAGE		3.68	0.89

Table 4 shows the average and standard deviation of students' motivation toward science learning in Junior High School according to the science learning value factor. Table 4 shows that the average of science learning value is 3.68. It is observed that SLV1 and SLV5 are above average. Junior high school students thought that science was important for daily life, and they were curious not only about nature and living things but also about phenomena that happen in this world. They stated that they mostly thought that science is important to learn because we can find out the reason for the phenomena in nature, for example, iron rusting and fruit falling from the tree, so they may use science in their daily life. The items coded SLV2, SLV3, and SLV4 are found to be below the average of science items. It is observed that the participant students still do not think that science may stimulate their thinking to solve problems, and they do not feel that inquiry activities are important for them. Only a few student participants stated that science might stimulate their thinking and that science could solve problems in daily life or in the future. This is related to students' science literacy ability where the value of science learning is related to whether students feel and comprehend the value of the science learning they are involved in. Scientific literacy is applying scientific knowledge, identifying questions, and drawing conclusions based on evidence to make rational choices about the environment (Noor, 2020). Learning about science builds analytical, logical, critical, and creative thinking abilities, which are necessary for everyday life (Hartono et al., 2022).

Table 5. Descriptive statistics for participants' SMTSLQ scores in performance goal factor

Items	N	Mean	SD
PG1	1018	1.96	0.95
PG2	1018	2.70	1.04
PG3	1018	3.52	1.06
PG4	1018	3.44	1.05
AVERAGE		2.90	1.02

Table 5 shows the average and standard deviation of students' motivation toward science learning in Junior High School according to the performance goal factor. Table 5 shows that the average performance goal is 2.90. It is observed that PG3 and PG4 are above average. Junior High School students participate in science

courses to get friends and teachers' attention. Participant students stated that they feel satisfied if the teacher gives positive affirmation to their participation in science courses. They also stated that they want to be a smarter student than others in science courses. The items coded PG1 and PG2 are found to be below the average of science items. It is observed that the participant students are willing to get a good score, and they only want to understand science courses because it was important to them. They also do not participate to perform better than other students in science courses. They only do what they like and do not always want to perform. This finding related to the extrinsic motivation. Extrinsic is generally associated with intrinsic that they may appear together when motivating students, and the multiplicative effect of these two factors as an extrinsic incentive was detrimental to academic achievement for students with high intrinsic motivation (Capunitan et al., 2023). Extrinsic motivation can help students who lack intrinsic motivation enhance their academic performance (Liu et al., 2020).

Table 6. Descriptive statistics for participants' SMTSLQ scores in achievement goal factor

Items	N	Mean	SD
AG1	1018	3.89	1.05
AG2	1018	3.49	0.88
AG3	1018	3.87	0.97
AG4	1018	3.61	0.90
AG5	1018	3.61	0.86
AVERAGE		3.69	0.93

Table 6 shows the average and standard deviation of students' motivation toward science learning in Junior High School according to the achievement goal factor. Table 6 shows that the average achievement goal is 3.69. It is observed that AG1 and AG3 are above average. Junior High School students felt fulfilled if they got a good score and solved a difficult problem in a science course. They stated that they were fulfilled when they got good scores in a science course because they felt that science is difficult. Also, they stated that they fulfilled if they solved difficult problems, especially difficult assignments in science courses. The items as coded AG2, AG4 and AG5 are found to be below the average of science items. It is observed that the participant students do not feel most fulfilled when they feel confident about the content in a science course. They also do not feel most fulfilled when other students or the teacher accept their ideas. The achievement goal is the feeling of satisfaction that students get when they increase their competence and achievement in science learning (Spandana et al., 2020). When students are satisfied, capable of solving issues, and confident in the topic being studied, their teachers and peers appreciate their views, and they receive good scores on exams, it gives a motivation for them to persist in studying science (Nasir et al., 2023).

Table 7. Descriptive statistics for participants' SMTSLQ scores in learning environment stimulation factor

Items	N	Mean	SD
LES1	1018	3.51	0.85
LES2	1018	3.61	0.85
LES3	1018	3.59	0.92
LES4	1018	3.06	0.91
LES5	1018	3.13	0.96
LES6	1018	3.45	0.89
AVERAGE		3.39	0.90

Table 7 shows the average and standard deviation of students' motivation toward science learning in Junior High School according to the learning environment stimulation factor. Table 7 shows that the average learning environment stimulation is 3.39. It is observed that LES1, LES2, LES3, and LES6 are above average. Junior High School students are willing to participate in a science course if the science content is exciting and changeable, the teacher uses a variety of teaching methods, the teacher does not put a lot of pressure on them, and they are involved in discussion. Mostly, participant students stated that science course is exciting, interesting, and challenging. They said that science would be more exciting if they conducted more laboratory activities and were practically close to nature. They also stated that the teacher is one of the factors that can make the science course more meaningful and useful. The discussion method is one of the methods that the students like. They like the kind of teacher who does not put a lot of pressure on assignments and achievement in science courses. The items coded LES4 and LES5 are found to be below the average of science items. It was observed that the students who participated were not willing to participate in order to get the teacher's attention, and science was challenging. They are only willing based on their willingness, not the teacher's willingness and the science content itself. Creating a positive science learning environment may stimulate students' interest in science classes and inspire them to seek career paths in science (Shin et al., 2023). When studying science, an innovative and interesting learning environment stimulates students' interest in learning. Furthermore, ways of teaching are varied, students participate in discussions, and rigorous learning motivates students to learn science (Nasir et al., 2023).

Findings Related to Research Question 2: "Is there a significant difference between grades 7, 8, and 9 in students' motivation toward science learning?"

For the second research question, the researcher investigated the significant difference in students'

motivation towards science learning among grades 7, 8, and 9 in Junior High School by using descriptive statistics and the Kruskal-Wallis test that is shown in Table 8 to Table 10. Table 8 shows how students' motivation toward science learning in junior high school is based on their grades by using descriptive statistics, which are average and standard deviation. The descriptive statistics for participants' SMTSLQ scores regarding their grades are shown in Table 8.

Table 8. Descriptive statistics for participants' SMTSLQ scores regarding to grades

Grade	N	Mean	SD
7	354	3.54	0.30
8	425	3.51	0.29
9	239	3.50	0.30
Average		3.52	0.30

It showed that in the samples, there were 354 seventh-grade students, 425 eighth-grade students, and 239 ninth-grade students. The highest average is 3.54, carried out from grade 7, the average of grade 8 was 3.51, and grade 9 was 3.50. Meanwhile, the highest standard deviation was 0.30, which was carried out from grades 7 and 9, and the other was 0.29, which was carried out from grade 8. The total average is 3.52, which means the students in Junior High School are categorized as having a high level of motivation in science learning. This study showed that students in the lowest grade, which is grade 7, have the highest motivation for science learning. This finding of research is related to the results of (Van Vo & Csapó, 2022) showed that students' motivation gradually decreased across grade levels.

Due to the data not having a normal distribution according to the grade, as a result, the researcher continued the Kruskal-Wallis test to determine the significant difference based on SMTSL questionnaire. The result is shown in Table 9 as the mean rank for each grade and in Table 10 as the result of the significant difference below.

Table 9. The results of the Kruskal-Wallis test (the mean rank) for the participants' SMTSLQ scores according to the grades

	Grade	N	Mean Rank
Self-Efficacy	Grade 7	354	542.58
	Grade 8	425	505.02
	Grade 9	239	468.47
	Total	1018	
Active Learning Strategies	Grade 7	354	506.47
	Grade 8	425	514.62
	Grade 9	239	505.00
	Total	1018	
Science Learning Value	Grade 7	354	528.54
	Grade 8	425	507.24
	Grade 9	239	485.32
	Total	1018	
Performance Goal	Grade 7	354	487.92
	Grade 8	425	497.22
	Grade 9	239	563.30
	Total	1018	
Achievement Goal	Grade 7	354	507.58
	Grade 8	425	514.16
	Grade 9	239	504.05
	Total	1018	
Learning Environment Stimulation	Grade 7	354	523.04
	Grade 8	425	498.91
	Grade 9	239	508.28
	Total	1018	

Table 9 shows the results of the mean rank for each grade in each factor. It is observed that self-efficacy in grade 7 is the highest rank compared to grade 9, while the opposite performance goal in grade 7 is the lowest rank compared to grade 9, and grade 8 is in the middle rank for both self-efficacy and performance goals

Table 10. The results of the Kruskal-Wallis test (the significant difference) for the participants' SMTSLQ scores according to the grades

	Self-Efficacy	Active Learning Strategies	Science Learning Value	Performance Goal	Achievement Goal	Learning Environment Stimulation
Kruskal-Wallis H	9.283	.225	3.163	10.793	.206	1.321
df	2	2	2	2	2	2
Asymp. Sig.	.010	.893	.206	.005	.902	.517

Table 10 shows the results of the Kruskal-Wallis test, which indicates that there is a significant difference among grades based on self-efficacy and performance goals. The self-efficacy factor has the value (Asymp. Sig) 0.010<0.05, and the performance goal factor has the value 0.005<0.05 (Asymp. Sig). Van Vo and Csapó (2022) investigated students' motivation towards science learning differ across grade levels. The finding showed that students' motivation gradually decreased across grade level. The younger groups (5th and 7th graders) seemed to achieve higher self-efficacy and motivation scores in learning science, while the older groups tended to be more concerned about the values and aims of learning science The other studies from (Józsa et al., 2017) stated that decreased motivation can have an impact on students' academic performance, which can have a significant impact on their overall success.

Schools, teachers, parents, and friends may all play a part in these age-related declines in motivation.

The majority of youngsters start school with more positive attitudes, enthusiasm, and motivation. Early in life, students' perceptions of their capacities to learn are more hopeful. In the early school year life, grade 7 students feel confident and optimistic about their new environment, which leads to increased self-efficacy. However, students may not fully understand academic objectives and challenges, causing lower performance goals. These changes and demands on self-efficacy in science learning may have a greater impact because they occur after only a year of experience with quite varied types of science learning (Dorfman & Fortus, 2019). After a year of middle school, grade 8 students become more comfortable with the academic necessities. Their self-efficacy may shift to a more realistic level as a consequence of their experiences. Students expected middle school science to be more challenging because the materials and topics becoming more difficult to learn, while the number of hours of learning and exams increased (Dorfman & Fortus, 2019). As students settle into their middle school years, they may begin to establish more ambitious performance goals. By grade 9, students face more challenging curriculum and increased pressure to graduate from high school or take the next year entrance examinations. This could lead to a decrease in self-efficacy as they struggle with more difficult subjects. Performance goals, on the other hand, may be higher in grade 9 as students become increasingly mindful of their future ambitions and the value of academic performance. The other significant differences between lower and middle school levels may influence students' self-efficacy in science learning, such as changes to the science curriculum, goal structures, and evaluation strategies (Dorfman & Fortus, 2019).

Conclusion

Students' motivation in science learning showed that grade 7 has the highest motivation with an average of 3.54, then grade 8 is 3.51, and grade 9 is 3.50. For the average, each dimension, such as self-efficacy, is 3.38, active learning strategies is 3.83, science learning value is 3.68, performance goal is 2.9, achievement goal is 3.69, and learning environment stimulation is 3.39. The total average is 3.52, which means the students in Junior High School are categorized as having a high level of motivation in science learning. Students' motivation in science learning is found to have significant differences in self-efficacy and performance goal factors in each grade. It is observed that grade 7 has the highest mean rank in self-efficacy and the lowest mean rank in performance goals, and vice versa for grade 9. This research is beneficial to see the illustration of how the students' motivation in science learning also can be a reference for science teachers to improve learning and teaching in science, how to engage the students, and their participation in science courses. In the next research, researchers should give solutions or suggestions for teaching and learning improvement to increase the student's motivation, especially in junior high school, including the method, media, and strategy of teaching and learning in science.

Acknowledgements
Praise be to God Almighty who has blessed this research so that it can be completed properly and smoothly. Thank you to the supervisor who always guided this research. Thank you also to my family for their support and prayers. Thank you to all those who have been involved in helping this research.

Author Contributions
This article was prepared by five people, namely A. D. N., N. W., W. F., L. H., E. All research members carried out each stage cooperatively until this article completed. All authors have read and agreed to the published version of the manuscript

Funding
This research was independently funded by researchers and International Program on Science Education (IPSE).

Conflicts of Interests
The authors declare no conflict of interest.

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