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Comparison of the Characteristics of Learning Responsibility and Science Process Skills of Junior High School Students in the Material of Composing Different Particles

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Abstract: Learning science is one of the ways that education works to improve the quality of human resources by enhancing personality and abilities. In this study, researchers adopted a specific quantitative methodology. The research instrument used a student learning responsibility questionnaire with 25 statements and observation sheets of students' scientific inquiry skills with 18 statements ranging from very bad to very good. 237 junior high school students from state schools on the east coast grade 7 were used as research samples selected using purposive sampling technique. Data from the research sample can be evaluated after it has been gathered. Both descriptive and inferential statistics were used in the data analysis. The results showed that there was a significant relationship between learning responsibility and science process skills of junior high school students in suburban cities. There is a positive and unidirectional relationship between student responsibilities and students' science process skills in science subjects for junior high school students in suburban cities as indicated by the correlation between student learning responsibilities and science process skills, a correlation coefficient of 0.710 is obtained. Based on the results of the Follow-up Test, the average responsibility of the three junior high school students in suburban cities is significantly different from the significance value used, which is 0.05. The significance value obtained for the character of responsibility is 0.020 which is lower than the significance value used, which is 0.05. The researcher suggests that future scientists utilize research findings as a source of information to carry out additional research and close gaps in their knowledge.

Keywords: Character; Responsibility; Science process skills

Introduction

Science Learning science is one of the ways that education works to improve the quality of human resources by enhancing personality and abilities. Science is a field of knowledge that offers real-world learning experiences and serves as the foundation for knowledge growth (Bantwini, 2015; Chen et al., 2020; Dewantari & Singgih, 2020). Science learning is a set of tried-and-true theories that account for patterns and regularities as well as carefully recorded natural events because natural phenomena in science may be analyzed in terms of viewpoints, objects, subjects, and problems (Gusti et al., 2020; Kelly & Erduran, 2019; Repnik et al., 2019; Suryaningsih, 2017). Integrated science, which encompasses investigating, speculating, doing experiments, and observing in order to produce, is the current science topic for Junior High School (SMP/MTs) equivalent education (Adilah & Budiharti, 2015; Pelger & Nilsson, 2018; Turkka et al., 2017). Chemistry, biology, and physics are the three disciplines that make up most scientific research. Learning science and applying it in real life are both crucial because scientific education, particularly physics, may train and improve students' science process abilities.

According to Durmaz et al. (2017) and Solé-Llussà et al. (2021) science process skills are procedural abilities acquired through methodical scientific experiments.

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Students must be taught science process skills to encourage the development of sensitive scientific attitudes that are expected to result from first-hand experience (Hayati et al., 2019; Hidayat et al., 2020; Ratnasari et al., 2018). Science process skills come in two flavors: integrated science process skills and fundamental science process abilities. Fundamental science process abilities include the ability to observe, categorize, communicate, measure, draw conclusions, and anticipate (Darmaji et al., 2019; Rezba et al., 2007; Senisum, 2021). Integrated science process abilities, such as recognizing variables, combining data, presenting data in a graphical format, expressing relationships between variables, gathering and processing data, assessing research findings, creating hypotheses, and manipulating variables, including those listed above, designing study outcomes, and carrying out experiments (Lepiyanto, 2017; Rosidi, 2016). The particles that make up objects are one of the most crucial physics topics to research in the realm of physics. Hence, in addition to having strong science process abilities, students must also take responsibility for their learning in order to develop the necessary competencies.

Students must exhibit responsibility in their academic lives. It is the personal duty of each student to participate properly in classroom activities (Aydın et al., 2018; Elviana, 2017). A purpose of national education is to produce morally upright people (Ernawati et al., 2022; Pasani & Basil, 2014; Ulubey & Aykaç, 2016). Responsibility is a highly crucial quality for pupils to possess because it is required when completing assignments assigned by the teacher (Lestariningsih & Suardiman, 2017). Responsibility is frequently used to describe the interaction between an individual and their immediate environment (Boudlaie et al., 2020; Kalichman, 2014). When making decisions, responsible people will be firm, gutsy, and willing to take chances (Hidayati et al., 2018). Student learning achievement will enhance if pupils can be responsible for themselves and accept responsibility for the assignments assigned (Hastuti et al., 2019; Syafitri, 2017).

Relevant research on science process ability has been carried out by previous researchers (Gasila et al., 2019). This research and previous studies have the same level of students, namely junior high school students, and student science process skills in learning science. In contrast to previous research which focused on natural science in general, the analysis of natural science learning materials in this study focused more on the particles that make up objects. Another distinction is that the science process skills studied in this study were obtained through practicum activities, while the science process skills learned in previous research were learned through scientific assessment questions. In addition, other relevant research has also been conducted by (Rahayu, 2016) regarding improving the character and responsibilities of elementary school children through product assessment in Mind Mapping learning is also relevant. The fact that both of these studies focused on the characteristics of student accountability makes it comparable to the other studies. The main difference between the two studies is that in this study, researchers looked at the nature of student accountability for science process skills, whereas previous research only looked at the nature of student responsibility in Mind Mapping learning with test subjects in elementary school children.

Based on a number of pertinent studies, the researchers conducted research to fill in the gaps left by earlier studies by using original methods. Science process skills and the nature of student accountability in scientific learning were the two factors that the researchers integrated in this study. Based on these two factors, the researcher performed this study to analyze how the problem, namely "What is the relationship between students' science process abilities and students' learning responsibilities in science learning on the particle material that makes up objects?", was formulated, with the goals; explain the science process abilities of the pupils as they learn about the constituent parts of objects; explain the obligations of student learning in science learning in the components of objects' constituent particles; and explain student responsibilities in learning science in the subject of the particles that make up objects are compared and related to students' process skills.

Method

In this study, researchers adopted a specific quantitative methodology. Research that primarily focuses on quantitatively assessing specific objects from a sample of a population in order to make inferences is known as quantitative research (Alkhateeb & Milhem, 2020; Darmaji et al., 2020b; Wang & Chang, 2018). Comparing one or more groups with a comparison group in order to identify differences or the impact of quantitative data is the purpose of quantitative research (Alkhateeb & Milhem, 2020; Darmaji et al., 2020a; Wang & Chang, 2018). Quantitative data are those that are numerical or in the form of numbers and may be calculated for analysis (Perdana et al., 2020; Sumual, 2017; Walsh, 2015). Researchers in this study prepared their data collection tools before gathering quantitative data.

The tools used to collect data or information needed for research are data collection instruments (Pranatawijaya et al., 2019). The research instrument used a student learning responsibility questionnaire and observation sheets of students' scientific inquiry skills. In the form of a Likert scale, character assessment forms and observation sheets of learning responsibility are provided. The Likert scale is a set of choices in a questionnaire that serves as a scale to determine the thoughts and attitudes of a person or group of people toward the subject being examined (Bahrun et al., 2018; Pranatawijaya et al., 2019; Saputra & Nugroho, 2017). There are 25 statements in the student responsibility character questionnaire, compared to 18 statements on the observation sheet, and a Likert scale with four possible responses, ranging from extremely terrible to very good. The results of the student accountability questionnaire for learning science are shown in the following table by category.

Table 1. Questionnaire Category of Student Responsibility in Science Learning the Material of the Particles that Makes up Objects

Indicator	Interval	Category
Carry out obligations	10.00 – 17.50	Not very good
	17.51 – 25.00	Not good
	25.01 – 32.50	Good
	32.51 – 40.00	Very good
Do group assignments together	5.00 – 8.75	Not very good
	8.76 – 12.50	Not good
	12.51 – 16.25	Good
	16.26 – 20.00	Very good
Responsible for every action	10.00 – 17.50	Not very good
	17.51 – 25.00	Not good
	25.01 – 32.50	Good
	32.51 – 40.00	Very good

Table 1 contains 15 item statements from the very bad, not good, good, and very good categories of a student learning responsibility questionnaire for science learning. Table 2 below shows the character questionnaire grid for student learning obligations. The four markers of the type of student accountability examined in this study are listed in Table 2. Also, Table 3 presents data for the observation sheet category used to gauge students' science process abilities about the constituent particles of the object.

Table 2. Questionnaire Category of Student Learning Responsibility on the Material for the Preparation of Object Particles

Indicator	Number of Statements
Carry out obligations	10
Do group assignments together	5
Responsible for every action	10

Table 3 shows Students' science learning process skills with 18 statements from the very bad, not good, good, and very good categories about the particles that make up objects. The lattice observation sheets of the students' science learning process skills are shown in Table 4.

Table 3. Category of Students' Science Process Skills

Indicator	Interval	Category
Observe	8.00 – 14.00	Not very good
	14.01 – 20.00	Not good
	20.01 – 26.00	Good
	26.01 – 32.00	Very good
Classify	4.00 – 7.00	Not very good
	7.01 – 10.00	Not good
	10.01 – 13.00	Good
	13.01 – 16.00	Very good
Measure	6.00 – 11.00	Not very good
	11.01 – 16.00	Not good
	16.01 – 21.00	Good
	21.01 – 26.00	Very good

Table 4. Lattice of Students' Science Process Skills in Science Learning the Particle Material that Makes Up the Object

Indicator	Number of Statements
Observe	8
classify	4
Measure	6

Table 4 is a lattice of students' science processes with 3 indicators studied in this study namely observing, classifying, and measuring. The equipment can be used to gather research data from samples in a population once they have been prepped for data collection. The participants in this study were all junior high school students from Muara Jambi's three public junior high schools. The population is the sum of all the examined subjects (Effendi-Hasibuan et al., 2020; Hashim et al., 2021; Rusydiyah et al., 2020). Samples are individuals from a group who are thought to have the ability to accurately represent the population (Aban & Tanusi, 2016; Mazen & Tong, 2020; Sugiyono, 2007). 237 junior high school students from public schools in grade 9 made up the study's sample. Purposive sampling was used to collect samples from the population. In order to maximize the results of the information gathered, sampling with a purposive technique is used to choose research samples that are by the study objectives (Mosabala, 2018; Najoli, 2019; Rohmah & Sutiarso, 2018). Students in grade 9 junior high school who had studied natural science teachings, particularly chemistry, in the area of particles building objects served as the basis for choosing the sample itself.

Data from the research sample can be evaluated after it has been gathered. Both descriptive and inferential statistics were used in the data analysis. Inferential statistics involve assumption tests and hypothesis tests, whereas descriptive statistics are used to determine the mean, median, mode, and so forth from each distribution table (Ismajli & Imami-Morina, 2018; Tambunan et al., 2021; Yalçın, 2017). The tests for normality, homogeneity, and linearity are employed as the assumption test. The data can be examined for the hypothesis if the significance value is larger than 0.05 (SIG > 0.05) (Chen et al., 2018; Ong et al., 2021; Ozdemir et al., 2018). Correlation and ANOVA tests are employed as the hypothesis tests. The correlation test is used to determine how one variable is related to other variables. The tested variable has a significant association with other variables if the significance value is less than 0.05 (Buchori & Cintang, 2018; Ertikanto et al., 2018; Pan, 2017). The ANOVA test was used to determine whether or not there was a significant difference. The variables under investigation show a significant difference if the significance level is less than 0.05.

Result and Discussion

The researcher uses IBM SPSS 23 to help with the first step, which is descriptive statistics. Table 5 below shows the descriptive test results from the student learning responsibility questionnaire data.

Table 5. Results of Descriptive Tests on the Particle Material Compiler of Objects' Questions about Students' Learning Responsibility

Interval	Category	f	%	Mean	Min	Max
25.00 – 43.75	Not very good	0	0	79.88	44.00	100.00
43.76 – 62.50	Not good	20	8.4			
62.51 – 81.25	Good	90	38.0			
18.26 – 100.0	Very good	127	53.6			

With a proportion of 53.6% or as many as 127 students out of 237 students having very good accountability, Table 5 is a descriptive test of the results of the student responsibility questionnaire in learning the content of the particles that make up things. A minimum score of 38.00 and a maximum score of 100.00 were required to achieve the average score of 79.88. Table 6 below shows the percentage of students with good character who are learning responsibility for their actions.

Table 6. Percentage of Students that Complete Science Responsibility Categories That Teach the Material Components of Each Indicator

Indicator	Category			
	Not very good (%)	Not good (%)	Good (%)	Very good (%)
Carry out obligations	0	3.7	28.8	67.5
Do group assignments together	0	5.7	31.3	63.0
Responsible for every action	0	6.0	34.7	59.3

Based on Table 6, it shows that 67.5% of students scored in the very good category for learning responsibility in the indicator of carrying out duties, 63.0% in the indicator of working in groups, and 59.3% in the indicator of taking responsibility for each action. This leads to the conclusion that the overall indications of student learning responsibility in the component parts of objects are excellent. Also, Table 7 below shows the outcomes of the descriptive exam based on observation sheet data of students' science process skills on the particle material of the arrangement of items.

Table 7 presents the results of a descriptive test of students' science process skills in the area of particles that make up objects, with the majority of students having very good skills in science (55.68%), or as many as 152 students out of 273 students. The minimum score was 36.00, and the maximum score was 60.00. The average score was 51.45. Each indicator for the proportion of students with science process abilities is shown in Table 8.

Table 7. Descriptive Test Results of Student Science Process Skills Observation Sheet

Interval	Category	f	%	Mean	Min	Max
15.00 – 26.25	Not very good	0	0	51.45	36.00	60.00
26.26 – 37.50	Not good	18	6.59			
37.51 – 48.75	Good	103	37.73			
48.76 – 60.00	Very Good	152	55.68			

According to Table 8, students' science process skills appear to be in the very good group for the observing indication with a percentage of 92.5%, the categorizing indicator with a percentage of 88.2%, and the measuring indicator with a percentage of 59.3%. As a result, it can be said that the overall indications of students' science learning process skills are quite strong. Following the completion of a descriptive test, the first assumption test the normalcy test can be performed. The results can be seen in table 9.

Table 8. Descriptive Test Results of Student Science Process Skills Observation Sheet

Indicator	Category			
	Not very good (%)	Not good (%)	Good (%)	Very good (%)
Observe	0	0	7.5	92.5
Classify	0	2.1	9.7	88.2
Measure	3.7	6.7	8.3	81.3

Table 9. Results of the Normality Test on the Student Science Process Skills Observation Sheets and the Learning Responsibilities Questionnaire on the Component Materials of Things

Variable	Kolmogorov-Smirnov		
	Statistic	Df	Sig
Student Responsibilities	.084	274	0.68
Science Process Skills	.096	274	0.66

Based on Table 9, the significance values for the student responsibility questionnaire's findings on students' knowledge of the objects' constituent particles are 0.68 and 0.66, respectively. Because the significant values obtained were greater than 0.05, which was the basis for doing the normality test, it was determined that the data distribution was normal for the variables of student accountability and science process skills. The homogeneity test is then conducted, and the results are shown in table 10.

Table 10. Results of the Homogeneity Test of the Questionnaire on Responsibility and the Observation Sheets of the Students' Scientific Process Abilities on the Particles of Composing Objects

Levene Statistic	Sig.
0.34	0.874

Based on Table 10, it is known that the significant value obtained is 0.874, and since this value is greater than 0.05 and is used as the basis for the homogeneity test, it can be inferred that the data are homogeneous or the same. After performing the homogeneity test, move on to the final assumption test, the linearity test, with the results being shown in Table 11 below.

Table 11. Outcomes of Students' Scientific Process Skills in Understanding the Composing Particles of Things and Observation Sheets of Students' Student Responsibility Questionnaire Test

	F	Sig.
Deviation from Linearity	.749	.893

Based on Table 11, it appears that the significance value achieved is 0.893, which is in conformity with the criteria for judging the results of the linearity test. As the significance value obtained is more than 0.05, it is determined that the data is linear. The researcher continued by conducting a correlation test, the results of which are shown in Table 12 below, after the assumption test was finished and it was discovered that the data distribution satisfied the criteria for testing the hypothesis.

Table 12. Results of the Correlation Test between Student Responsibilities and Students' Science Process Skills in Learning the Composing Particles of Objects

Variable		f	%
Student Responsibilities	Pearson Correlation	1	0.710**
	Sig. (2-tailed)		0.000
	N	237	237
Students' Science Process Skills	Pearson Correlation	0.710**	1
	Sig. (2-tailed)	0.000	
	N	237	237

The purpose of this correlation exam is to ascertain the relationship between students' obligations in science learning and their scientific method competencies in science learning in the constituent parts of things. There is a correlation between the two variables if the significance value is less than or equal to 0.005, while there is no correlation if it is greater than 0.005. Based on Table 12, a significance value of 0.000 < 0.005 is found, indicating a substantial correlation between junior high school pupils in suburban cities. Regency's science learning responsibilities and their science process skills. A correlation value of 0.720 was found between student learning responsibilities and learning preferences. In junior high schools in suburban cities, there is a positive and unidirectional relationship between students' responsibilities and their ability to engage in scientific inquiry. This is indicated by the positive coefficient value. So, it may be said that there is a favorable, important, and solid link. The next step after doing a correlation test is to run an ANOVA test to compare and discover any differences between each of the variables examined in each school.

Based on Table 13, it is clear that the character of responsibility has a significance value of 0.020, which is lower than the significance value used, which is 0.05. As a result, the average student responsibility of the four junior high schools in suburban cities, learning science, differs significantly depending on the materials used to create the object particles. In the ANOVA test, the assumption is that the average data is different if the significance value is less than 0.05, and the assumption is that the average data is the same if the significance value is larger than 0.05. Based on Table 7, it is also clear that students' significance values for science process skills are 0.006, which is less than 0.05. As a result, there is a significant difference in the average level of responsibility for studying science across the four junior high schools in suburban cities.

If the data under analysis show a significant average difference, additional testing of the ANOVA test is required. The ANOVA test used in this study revealed that there was a significant average difference between the three SMPs investigated. The Scheffe advanced test must therefore be used to determine whether courses have different average responsibilities and science process skills. Table 14 lists the findings of Scheffe's further tests.

Table 13. Data Anova Test of Responsibilities and Science Process Skills of Students

	Sum of Squares	Mean Square	F	Sig.	Variable
Between Groups	814.074	407.037			
Within Groups	4075.842	94.787	4.294	.020	Student Responsibilities
Total	4889.915				
Between Groups	897.160	448.580			
Within Groups	3220.370	76.675	5.850	.006	Students' Science Process Skills
Total	4117.531				

According to Table 14, the significance value less than 0.05 (Sig. 0.05) or the asterisk in the mean difference column can be used to determine which class pairs have significant differences in responsibility and science process skills. Class B and C couples exhibit a significant difference based on table 8 for the character of responsibility, with a significance value of 0.025 and an average difference of 6.16190. Class pairings A and B and class pairs A and C exhibit notable disparities in terms of science process skills, where the average difference between classes A and B is 4.83333 with a significance value of 0.048. Class A and C couples contrast with an average difference of 6.33333 and a significance value of 0.009.

Based on the data shown in Tables 5, 6, 7, and 8 regarding the descriptive test, it is known that 237 dominant students had very good responsibility with a percentage of 53.6% in the results of the student responsibility questionnaire in science learning, while on the results of the descriptive test of students' science process skills. According to the examination of the observation sheets, pupils' proportion of 55.68% science process skills was deemed to be extremely good. Each of the indicators of student responsibility falls into the very good category overall, with a percentage of 67.5% for carrying out commitments, 63.0% for completing group assignments, and 59.3% for being accountable for every activity. According to the indicator of fulfilling responsibilities, student responsibility looks to be at its maximum level. Also, the percentages obtained for the categorizing indication were 88.2% and the measuring indicator was 59.3% on the indicator of students' science process skills. Hence, it is known that pupils generally exhibit excellent responsibility and science process abilities.

Table 14. Scheffe Advanced Test Output Results

Variable	(I) SMP	(J) SMP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Student Responsibilities	SMP A	SMP B	-4.48739	2.10823	.116	-9.8329	.8581
		SMP C	1.67451	2.06933	.723	-3.5724	6.9214
	SMP B	SMP A	4.48739	2.10823	.116	-.8581	9.8329
		SMP C	6.16190*	2.17078	.025	.6578	11.6660
	SMP C	SMP A	-1.67451	2.06933	.723	-6.9214	3.5724
		SMP B	-6.16190*	2.17078	.025	-11.6660	-.6578
Students' Science Process Skills	SMP A	SMP B	4.83333*	1.88823	.048	.0416	9.6251
		SMP C	6.33333*	1.95240	.009	1.3787	11.2879
	SMP B	SMP A	-4.83333*	1.88823	.048	-9.6251	-.0416
		SMP C	1.50000	1.92272	.739	-3.3793	6.3793
	SMP C	SMP A	-6.33333*	1.95240	.009	-11.2879	-1.3787
		SMP B	1.50000	1.92272	.739	-6.3793	3.3793

*The mean difference is significant at the 0.05 level.

Tables 9, 10, and 11 show the findings of the assumption test, which consists of the normalcy test, homogeneity test, and linearity test, based on the outcomes of the inferential statistical test. The significance value for the normality test results for the student accountability variable is 0.068, and the significance value for the science process skills variable is 0.066. The significance values for the homogeneity and linearity tests were 0.874 and 0.893, respectively. If the significance value achieved in the assumption test is more than 0.05, it can be decided whether to continue with hypothesis testing on the basis of the data. Because the results of the data gathered in this study had significance value larger than 0.05, it was determined that the data had a linear relationship, were homogeneous, and had a normal distribution. As a result, hypothesis testing could proceed.

Based on the outcomes of a correlation test to assess the relationship between students' scientific learning responsibilities and science process abilities in PA learning. There is a correlation between the two variables if the significance value is less than or equal to 0.005, while there is no correlation if it is greater than 0.005. Based on table 12, a significance value of 0.000 0.005 is found, indicating a substantial correlation between junior high school pupils in suburban cities Regency's science learning responsibilities and their science process skills. A correlation value of 0.720 was found between student learning responsibilities and learning preferences. In junior high schools in suburban cities, there is a positive and unidirectional relationship between students' responsibilities and their ability to engage in scientific inquiry. This is indicated by the positive coefficient value. So, it may be said that there is a favorable, important, and solid link. Also, an ANOV test was run to determine whether or not there was a substantial change.

If the data under analysis show a significant average difference, additional testing of the ANOVA test is required. The ANOVA test used in this study revealed that there was a significant average difference between the three SMPs investigated. Based on Table 13, it is clear that the significance value obtained for the character of responsibility is 0.020, which is lower than the significance value used, which is 0.05. This means that the average responsibility of students from the three junior high schools in suburban cities, learning science, the material that constitutes the object particles, differs significantly. There are variances, so additional testing with the Scheffe advanced test is required to determine which courses have distinct average responsibilities and science process skills.

The aim of this study is to fill in the gaps left by previous investigations. One of his studies (Gasila et al., 2019) focuses on students' scientific process abilities. The findings of this study indicate that students at Public Middle Schools in Pontianak City have very good science process skills. Of each indication, the observation indicator has the highest average score of 89.9. This study and this research are comparable because they both assess students' KPS in science learning using a sample of junior high school students. The material studied in this study was more specific natural science material, namely the particles that make up objects, whereas in the previous research (Gasila et al., 2019), the material studied was natural science in general. Sampling in this study using purposive sampling technique, while in this study using random sampling technique. Another difference is that the KPS studied in this study were obtained through practicum activities, while the KPS studied in previous research (Gasila et al., 2019) was studied through scientific assessment questions. Variations in the variables studied are also diverse; in this study the variables are the abilities and tasks of students in the scientific method.

Students needs to exhibit responsibility when learning. It is the personal duty of each student to engage fully in classroom learning activities (Aydın et al., 2018; Elviana, 2017). It is crucial for students to have the character of responsibility because it is required when completing assignments assigned by the teacher (Lestariningsih & Suardiman, 2017). Student learning achievement will rise if they can be accountable for themselves and the assignments they are given (Hastuti et al., 2019; Syafitri, 2017). In addition, students' science process skills are very high because they have very good responsibilities. In order to solve problems in people's life, science process skills can develop and train critical and logical thinking abilities. Experiential or scientific methods that directly involve pupils do significantly better in terms of retaining information in long-term memory. As direct experience increases concept awareness, develops critical thinking abilities, and has a positive impact on learning outcomes, students are less likely to have misconceptions about science process skills. The learning outcomes of students with poor critical thinking and science process abilities will differ from those of students with strong critical thinking and science process skills.

The researcher plans to examine the relationship between responsibility and students' science process skills in the particle material that constitutes objects, which has not been done by previous researchers as a form of research updating conducted by researchers, based on prior studies that are pertinent to this research. Three markers of student responsibility were looked for in this study: meeting obligations, cooperating on group projects, and taking responsibility for every activity. Moreover, take a close look at two measures of pupils' proficiency in the scientific method: classifying and measuring.

The findings of this study have significance for raising educational standards, particularly in learning activities like practicums. Imran (2016) asserts that practical learning experiences like practicums, which can improve students' science process abilities, are one way to get students more engaged in classroom activities. Previous research by Rahayu & Anggraeni (2017) confirms that students' learning process abilities can be increased by direct learning experiences giving confidence in this. Students are better able to understand the process or action being carried out thanks to first-hand experience. It will be clear what the students' roles in these activities and the learning are during the direct learning experience.

As a result, the researcher advises that future researchers make use of the study's findings as a source of information to do additional research and close any gaps in their knowledge. Future studies should be able to investigate students' responsibilities using more indications that this study did not examine, as well as additional indicators of students' science process skills, like integrated process skills, which this study did not carry out. Researchers can look into various learning contexts where there may be a correlation and influence of student accountability on students' science process abilities in addition to science learning, particularly physics.

Conclusion

Based on the results of the correlation test to determine the relationship between student responsibility and students' science process skills in science learning, it shows that there is a significant relationship between learning responsibility and science process skills of junior high school students in suburban cities. There is a positive and unidirectional relationship between student responsibilities and students' science process skills in science subjects among junior high school students in suburban cities, as indicated by the correlation between student learning responsibilities and learning styles, which obtained a correlation coefficient of 0.710. According to the Follow-Up Test results, the average student responsibility of the three junior high schools in suburban cities is significantly different from the significance value used, which is 0.05. The significance value obtained for the character of responsibility is 0.020, which is lower than the significance value used, which is 0.05. Class B and C pairs, with a significance value of 0.025 and an average difference of 6.16190, are the class pairs where there are statistically significant differences in the learning responsibility variable. Class pairings A and B and class pairs A and C both exhibit notable disparities in terms of science process skills, where the average difference between classes A and B is 4.83333 with a significance value of 0.048. Class A and C couples contrast with an average difference of 6.33333 and a significance value of 0.009. The researcher suggests that future scholars make use of the study's findings as a source of information to conduct additional research and close any gaps in their knowledge.

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Harizon: Creating, Writing, Revising articles and responsible for research; Asrial: Instrument making; Haryanto and Dwi Agus Kurniawan: Data Analysis and Processing; Riska Fitriani and Rahmat Perdana: carried out the data collection.

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