



The Perceptions of Secondary School Students' About Learning Activities from Home Affect Cognitive Learning Outcome in Natural Science Subject

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ABSTRACT

This study aims to describe students' perceptions of learning activities from home that affect cognitive learning outcomes in natural science subjects in secondary school school. The research method used is quantitative ex post-facto correlation. The population and sample used were 8th grade students at SMP Muhammadiyah 9 Boarding School Tanggulangin Sidoarjo. Data collection techniques using questionnaires and documents. The data analysis technique used is descriptive qualitative statistics with percentages and inferential statistics with product moment correlation test. The results of research on students' perceptions of learning activities from home obtained nine indicators, including 1) the effectiveness of learning from home was 72.2% in the fairly good category, 2) access to learning activities from home was 71.6% in the fairly good category, 3) assistance with learning from home at 70.6% in a fairly good category, 4) reactions to learning tasks from home at 48.4% with a bad category, 5) subject difficulties of 78.2% with a fairly good category, 6) learning material from home by 76% in the fairly good category, 7) learning media from home by 78.7% in the fairly good category, 8) evaluation of learning from home by 75.2% in the fairly good category, and 9) clarity of instructions by 76.6% with quite good category. The results of inferential statistical analysis show that students' perceptions of learning activities from home affect student learning outcomes in natural science subjects, as evidenced by the correlation coefficient value of $0.272 > 0.05$. Future research is expected to be able to dig deeper into other factors that influence student learning outcomes in natural science subjects.

INTRODUCTION

Currently, Indonesia is experiencing a disease pandemic that is spreading very quickly and has spread throughout the world. The Novel Coronavirus Disease-2019 (covid-19) originating from Wuhan, Hubei province of China has spread rapidly throughout the world and on March 11, 2020 the World Health Organization (WHO) has even declared this event a global pandemic (Cucinotta & Vanelli, 2020). Various countries have implemented social distancing designed to reduce interactions between people in the wider community (Freedman, 2020). Indonesia spontaneously implemented a policy of studying from home, working from home, worshipping from home, and etc (Darmalaksana, 2020). In learning activities at home, assignments and subject matter are carried out through online applications, in this case the use of laptop technology, cellphones, computers plays a major role in the world of education today as well as various online application media such as e-learning, Google Classroom, Ruang Guru, and other online applications that support it.

The online learning atmosphere can accommodate students to play a more active role in learning, students make designs and search for material with their own efforts (Santyasa, 2013). In increasing the role and activity of students and the running of the online learning process so that learning objectives can be achieved is very much influenced by student perceptions (Nugroho, 2015). In line with the opinion of Harefa & Sumiyati (2020) the most important indicator that is closely related to the online learning process so that its implementation can run more optimally, thoroughly and intact, namely student perceptions. Perception is a process that begins with the sensing process, namely the process of receiving a stimulus through the senses or called the sensory process (Walgito, 2002). Students' perceptions of learning activities from home are very important to pay attention to in the learning process because they affect students both in terms of thinking and student learning outcomes. Learning outcomes are a change in behavior that occurs in students through the learning process (Zulkifli, 2019). Cognitive learning results are obtained after students carry out evaluations or tests on subjects.

Cognitive learning outcomes are things that happen when the teacher evaluates the learning process not what the teacher presents, but can be influenced by the results obtained when the interaction is carried out in obtaining information from both the teacher's explanation and information from other media that require students to can manage the information that has been obtained based on the understanding students have (Gita et al, 2016). Research by Mulyana et al (2016) concerning the relationship between perceptions, interests, student attitudes and student learning outcomes related to learning. The learning outcomes achieved by students are closely related to the formulation of planned instructional objectives grouped into three criteria domains, namely the cognitive, affective and psychomotor domains (Jihad, 2013).

This problem is also found in SMP Muhammadiyah 9 Boarding School Tanggulangin. This study found that many students complained about doing the assignments given by the teacher, many students did not like learning from home, not all students had cellphone or laptop facilities, poor internet networks also hampered the learning process and students and teachers also had to adapt in using online learning support applications. The solution to these constraints is that learning can be more interesting so that students like and are more enthusiastic about learning, hold discussions with students to discuss the obstacles that occur in the learning process.

METHODS

This research is a descriptive quantitative research with ex post-facto correlation method. Ex post-facto research is research where independent variables have occurred because research begins with observing the dependent variable in a study (Sukardi, 2012). The population and research sample were all students of 8th grade at SMP Muhammadiyah 9 Boarding School Tanggulangin totaling 47 students. The sampling technique uses saturated sampling technique. Another term for saturated sampling is a census, where all members of the population are sampled (Sugiyono, 2018). Data collection techniques used are questionnaires and documentation. The research procedure is by giving a questionnaire to students which contains 26 statements. The questionnaire given to students has gone through expert validity tests and trials on other students to determine the quality of the items. The criteria for the questions used in this study are valid, reliable, differentiating power and varying degrees of difficulty (Arikunto, 2013). The results of the validity test stated that there were 19 statements that were invalid and 10 statements that were not reliable. Invalid statements are replaced with other statements for data retrieval. The result of the reliability coefficient is 0.41 with moderate criteria.

The first data analysis uses a descriptive quantitative approach technique. The results of data collection were calculated with the help of the IBM SPSS 26.0 application to describe the results of a questionnaire on student perceptions about learning activities from home, so the results of the analysis of each positive statement item were converted to the conversion criteria for achieving predetermined qualifications. The second data analysis uses descriptive quantitative statistics on the correlation test to describe students' perceptions of learning activities from home affecting Cognitive

Learning Outcomes in Science Subjects in Junior High Schools. This research uses normality test, homogeneity test and correlation test. Questionnaire normality test through the Shapiro-Wilk test (Normadiah & Wah, 2011) and decisions in the homogeneity test in SPSS according to 30 Arifin (2017), are: a) If the significance value is <0.05, it means that the data is not homogeneous. b) If the significance value is > 0.05, it means that the data is declared homogeneous. The next test is the correlation test using the product moment test. The correlation test to be tested in this study is as follows:

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\} \{N\sum Y^2 - (\sum Y)^2\}}}$$

RESULTS AND DISCUSSION

1. Student perceptions of learning activities from home

This research was conducted by distributing questionnaires to students to describe students' perceptions of learning activities from home which consisted of 26 statements. The lattice statements are as follows.

Table 1. Questionnaire Grid of Students' Perceptions of Learning Activities from Home

Indicator	Item Statement
Efectiveness of learning from home	1,2,3
Access of learning from home	4,5,6
Home study assistance	7,8,9
Reaction to learning from home assignment	10,11
Subject difficulty	12,13,14
Home study material	15,16,17
Home study media	18,19,20
Evaluation of learning from home	21,22,23
Clarity of instructions	24,25,26

Based on Table 1, students' perceptions of learning activities from home will then be described. The results of the analysis of each item statement are taken to be an average of positive statements and converted to the following achievement and qualification level criteria.

Table 2. Conversion of Achievement and Qualification Levels

Criteria	Qualification
80% - 100%	Very Good
60% - 79%	Good
50% - 59%	Poorly
< 49%	Not Good

(Source: Pribowo, 2014)

Table 2 used to an analysis of filling out the questionnaire on student perceptions about learning from home activities in 8th grade of SMP Muhammadiyah 9 Boarding School Tanggulangin is presented as follows.

Table 3. The Results of Data on Student Perceptions of Learning Activities from Home

Indicator	Percentage (%)	Criteria
Efectiveness of learning from home	72.2	Good
Access of learning from home	71.6	Good
Home study assistance	70.6	Good
Reaction to learning from home assignment	48.4	Poorly
Subject difficulty	78.2	Good

Home study material	76.0	Good
Home study media	78.7	Good
Evaluation of learning from home	75.2	Good
Clarity of instructions	76.4	Good

Table 3. Shows that of the 9 indicators there are 8 indicators stated in the good category, namely the effectiveness of learning from home indicator of 72.2% is stated in the good category, access of learning from home is 71.6% stated in the good category, home study assistance is 70.6 % stated in the good category, 78.2% subject difficulty was stated in the good category, 76% home study material was stated in the good category, 78.7% home study media was stated in the good category, evaluation of learning from home was 75.2% stated in the good category and the clarity of instruction indicator of 76.4% was stated in the good category, but there was one indicator which was stated in the bad category, namely the percentage of 48.4 in the indicator for reaction to learning form home assignment.

In this study using a questionnaire or questionnaire to determine students' perceptions of learning activities from home. This research was carried out during the Covid-19 pandemic which was spreading throughout the world, one of which was in Indonesia. Of course, in the current pandemic conditions, it is very difficult to collect data with very short time constraints. This research was conducted using a saturated sample technique, which means that all students in 8th grade, totaling 47 students. This study has 9 indicators, namely indicators of the effectiveness of learning from home, access to learning from home, learning companions from home, reactions to learning tasks from home, subject difficulties, learning materials from home, learning media from home, evaluation of learning from home, and indicators of clarity instructions.

The indicator for the effectiveness of learning from home is 72.2%, which is in a pretty good category. The effectiveness of learning from home can be seen from the achievement of learning objectives, the greater the percentage level, the higher the level of learning effectiveness. The effectiveness of learning from home is a measure of success in the learning process. Effectiveness in general shows how far the predetermined learning objectives have been achieved (Müller et al., 2018). Effectiveness is a measure that states how far the target (quantity, quality and time) has been achieved, or the greater the percentage of targets achieved, the higher the effectiveness (Rochmawati, 2015). The effectiveness of learning from home is not only seen from learning achievements but also must be seen from the processes and facilities used by students during learning. This is in line with the research results of Hikmat, et al (2020) based on research results showing that the effectiveness of online learning reaches the first rank of 0.88, this means that learning is carried out effectively. Research results by Farell, et al (2021) based on research results show that online learning is quite effective, but the weakness of online learning is there is no social interaction between students and teachers which results in a lack of focus in academic and social activities which causes low learning outcomes.

In the indicator of access to learning from home, a percentage of 71.6% is stated in the fairly good category. Access to learning from home must be supported by teacher readiness in following changes in technology and information-based learning. Students are used to using the internet so it's easy to access learning, while not all teachers are able to use the technology that is currently developing. Pribowo (2020) which explains the behavior of children and adolescents in using the internet as much as 84% of the total number of Indonesian people. Online learning is completely dependent on the internet network, often problems regarding the internet connection are interrupted or the internet network is not strong enough and students do not have their own mobile phones or laptops making it difficult for students to access learning while at home. Without a cell phone, online learning cannot be carried out (Putria et al, 2020). There are obstacles experienced by students while implementing online learning such as problems with the internet network (Corinna et al., 2020). This is in line with research conducted by Asmuni (2020) based on

research results showing that the implementation of online learning has various problems, one of which is weak ICT mastery and limited supporting facilities and internet networks so that many students are less active in learning.

The indicator for learning assistance from home with a percentage of 70.6% is stated in a fairly good category. Assistance from parents or from other family needs to be done to supervise students during learning and help students during the learning process (Rizaldi et al, 2021). Dewi (2020) explains that online learning is carried out through parental guidance. The pandemic condition, which requires students to study from home, makes parents experience problems because many parents work, so there is very little time to accompany their children during learning. The results of Nugraha's research (2020) based on research results show that the obstacles to online learning are that parents have to add time to accompany their children and not all parents are able to adapt to technological advances.

In the subject difficulty indicator, a percentage of 78.2% is stated in a fairly good category. Students do not find it difficult because they get learning material from various sources such as learning books and also via the internet, but there are still many students who also experience difficulties in understanding subjects (Anshari et al, 200017). Difficulties in learning subjects either from difficulty understanding the material or lack of focus during learning can also occur or environmental factors from an uncomfortable learning atmosphere. Factors that cause student learning difficulties come from internal and external factors (Dalyono, 2015). This is in accordance with research conducted by Cahyani et al (2020) that 61.1% of students stated that they could not find the right time to study at home because of various influencing factors such as the home atmosphere which was not conducive so that students could not focus in studying and hard to find a quiet place.

The indicator for learning materials from home with a percentage of 76% is stated in a fairly good category. The material taught is adjusted to the curriculum while learning from home takes place and the teacher makes learning interesting so that students can enjoy learning so that it can improve students' understanding and cognitive learning outcomes (Aliyyah et al, 2020). Chandrawati (2010) teachers are expected to be able to present material via the web that is interesting and in demand, provide guidance and communication via the internet and other skills needed. This research is different from the results of Turmuzi & Dasing's research (2021) which stated that the material delivered by the teacher was difficult for students to understand, 50.9% or 27 respondents answered that the material presented was difficult to understand.

The media indicator for learning from home with a percentage of 78.7% is stated in the pretty good category. While studying from home students are required to use learning media through the Google Classroom application, learning videos or other applications. The ability of learning videos can be relied upon to learn motor skills and train students' abilities (Palao et al, 2015). Learning videos have the advantage that videos can manipulate time and space, students can also travel anywhere even though they are limited by space (Uno & Lamatenggo, 2011). This research is supported by the research of Hikmatiar et al, (2020) showing that the use of Google classroom as a learning medium has a positive impact on improving learning outcomes, student interest and motivation in learning and fostering creative attitudes in students.

The evaluation indicator for learning from home with a percentage of 75.2% is stated in the pretty good category. Evaluation of learning from home is very important in education to determine understanding and acceptance of the material conveyed by the teacher to students (Troncoso, 2012). Evaluation in general can find out the strengths and weaknesses in the learning process carried out by the teacher. Evaluation is a part that must be in the implementation of activities or programs to ensure goals are in accordance with learning standards (Yudiawan, 2020). There are also several factors that hinder the evaluation of learning while studying from home, one of which is games and television which make students less focused during the evaluation process. This is supported by Juliantine's research (2013) that an assessment in education is used to review the success of students in following the learning process which

includes cognitive aspects and is used to determine the attainment of basic competencies and develop student competencies. This was also said by researcher Mustakim (2020) There are obstacles regarding the evaluation process in online learning which are felt to be too heavy.

The indicator of clarity of instructions with a percentage of 76.4% is stated in the pretty good category. The teacher is a facilitator when learning from home. The importance of the teacher in giving clear instructions to students both in giving short material so that students understand it more easily, as well as from interesting explanations or learning processes to be preferred by students, but the teacher is also not a determining factor in student experience or learning outcomes (Biggs et al, 2022). Robin & Frank (2010) that in online learning, teachers, lecturers, tutors, instructors become facilitators, guides, or even expert resource persons, and are no longer the sole determinants of student learning experience. This is supported by research by Kurniasari, et al (2020) which states that the clarity of instructions when giving assignments is not too much, and giving material briefly makes it easier for students to better understand the instructions given by the teacher.

The reaction indicator for learning from home tasks with the lowest percentage of the other indicators, namely 48.4%, is stated in the bad category. Students often complain about the assignments given by the teacher. Students feel that studying for too long by looking at laptops or cellphones often makes students feel dizzy and tired so that students are lazy to do the task. Sidabutar, et al (2029) showed that the use of gadgets can cause headaches and eye irritation. According to Ilyas (2016) tired eyes can occur if the eyes focus on objects that are close up for a long time and the eye muscles work harder to see objects, especially with dazzling lighting. Purwati (2012) shows that the source of stress in learning from home activities comes from situations that are too monotonous, too many assignments, and short task deadlines. This is in line with research conducted by Liviana et al, (2020) showing that learning tasks are the main factor causing student stress during the co-19 pandemic.

2. Students' Perceptions About Learning Activities from Home Affect Cognitive Learning Outcomes in Science Subjects in Middle School

The results of the normality test were carried out to find out whether the distribution of data was normally or not normally distributed in order to find out whether the statistical test that would be used had an effect or not in the research being conducted. The results of the normality test in this study are as follows.

Table 4. Normality Test Result

Value	Description	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
	Cognitive Learning Outcome	.169	47	.002	.938	47	.016
	Perceptionc of Learning Activities from Home	.180	47	.001	.896	47	.001

a. Lilliefors Significance Correction Source: IBM Spss 26.0

Based on Table 4, it was found that the significance value in the Shapiro-Wilk normality test was 0.016 for cognitive learning outcomes, while in the perception of learning activities from home it was 0.001 with a significant value used in the normality test, namely 0.05, so the results of the data were stated to be normally distributed. The homogeneity test results in this study used the IBM SPSS 26.0 application. The homogeneity test results can be seen as follows.

Table 5. Homogeneity Test Results

	Levene Statistic	df1	df2	Sig.	
Value	Based on Mean	1.259	1	92	.265
	Based on Median	.630	1	92	.429
	Based on Median and with adjusted df	.630	1	85.542	.429
	Based on trimmed mean	.921	1	92	.340

Based on the data in Table 5, the homogeneity test results show a significant value of 0.265 greater than 0.05, so the data is said to be homogeneous. The data obtained in this study met the requirements for the correlation test using the product moment test.

Table 6. Product Moment Correlation Test Results

		Cognitive Learning Outcome	Perceptions of Learning from home
Cognitive Learning Outcome	Pearson Correlation	1	.164
	Sig. (2-tailed)		.272
	N	47	47
Perceptions of Learning Activities from Home	Pearson Correlation	.164	1
	Sig. (2-tailed)	.272	
	N	47	47

Based on table 6, the results show that the correlation coefficient between cognitive learning outcomes (X) with the perception of learning activities from home (Y) is $(r) = 0.272$. Based on the decision criteria above, it can be concluded that the two variables have a significant relationship between cognitive learning outcomes and students' perceptions of learning activities from home. Based on Table 6, interpretation of the correlation coefficient, it is found that the level of correlation in this study is stated in the low category.

To describe the effect of students' perceptions of learning activities from home on cognitive learning outcomes by taking students' cognitive learning outcomes in the form of daily test scores and statistical tests are carried out, namely normality tests, homogeneity tests and correlation tests. The sample used was all 47 students at SMP Muhammadiyah 9 Boarding School Tanggulangin. Based on the results of data analysis, it can be seen that the significance value of 0.272 is greater than the significant value of 0.05 so that H_0 is accepted. This means that there is no significant relationship between cognitive learning outcomes and students' perceptions of learning activities from home. Correlation coefficient value $(r) = 0.164$ less than the value of r table = 0.396 so that H_0 is accepted. The moderate correlation coefficient is located in the interval 0.00 – 0.199 (Sugiyono, 2015). Cognitive learning outcomes with students' perceptions of learning activities from home are in the very low category. The results of the correlation test between cognitive learning outcomes and students' perceptions of learning activities from home show that students' cognitive learning outcomes are not fully influenced by students' perceptions of learning activities from home, but are also influenced by external factors and other internal factors (Akyol & Garrison, 2011).

The results of this study are also supported by several other studies which say that there is no significant relationship between students' perceptions of learning activities from home and cognitive learning outcomes (Hosler & Arend, 2012). The results of Sukardi's research (2019) show that there is no significant relationship between student perceptions regarding online learning and learning outcomes. Coefficient $r = 0.13$, coefficient of determination $0.132 = 0.017$. Thus, the value of the contribution of perceptions to learning outcomes is only 1.70%, in other words, 98.30% of learning outcomes is determined by other factors. The results of Najichun's research, Winarso (2016) show that there is no relationship between student perceptions of

student mathematics learning outcomes. This research also contrasts with other studies. The results of Fitriana's research (2016) based on the results of the analysis show that there is a significant relationship between perceptions and learning outcomes of 12th grade IPS students' geography at Homeschooling Dolan School Malang city with student scores in the good category with an average of 78. Based on the results of calculations with correlational analysis, namely $r_{\text{count}} = 0.59 > r_{\text{table}} = 0.456$ with a significant level of 5%. The results of Rosa's research (2021) show that $r_{\text{count}} = 3.464$ which is greater than $r_{\text{table}} 0.230$. There is an influence between students' perceptions of online learning on student learning outcomes in 7th grade of Islamic Cultural History subjects at MTs Negeri 2 Sidoarjo.

Research conducted by researchers with various other studies can be concluded that cognitive learning outcomes can be influenced by things other than student perceptions such as factors from the student's environment or factors from student psychology (Eom & Ashil, 2016). According to Siti & Sobandi (2016) the learning outcomes obtained by students there are two influencing factors, namely are internal factors that affect student learning outcomes are influenced by several things including health problems, fatigue factors, physical deficiencies and psychological factors that students have. External factors that affect student learning outcomes are factors in the family, the environment both in the school environment and in the community environment (Asvio, 2022).

CONCLUSION

Based on the results of the research and discussion, it can be concluded as follows: 1) students' perceptions of learning activities from home in 8th grade of SMP Muhammadiyah 9 Boarding School Tanggulangin Sidoarjo obtained the result that 9 indicators consisting of the effectiveness of learning from home at 72.2% were stated in the sufficient category good, access to learning from home by 71.6% is stated in the quite good category, learning assistance from home by 70.6% is stated in the category quite good, reactions to learning tasks from home by 48.4% are stated in the category not good, eye difficulties lessons of 78.2% are stated in the fairly good category, learning material from home is 76% stated in the fairly good category, learning media from home is 78.7% stated in the category is quite good, evaluation of learning from home is 75.2% stated with a pretty good category, the clarity of instructions of 76.6% is stated in a pretty good category, and 2) there is an influence on the person's perception students' about learning activities from home on cognitive learning outcomes as evidenced by a correlation coefficient (r) of 0.272 which states that the level of correlation is low. Future research is expected to be able to dig deeper into other factors that influence student learning outcomes in science subjects.

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