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## Learning achievement: outdoor learning model and naturalist intelligence

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### ABSTRACT

This study aims to determine the effect of outdoor learning models and naturalist intelligence on student learning outcomes in science subjects. The research data were obtained through quantitative data in the form of science test results and a Likert scale from a naturalist intelligence questionnaire. Indoor learning treatment was carried out on 20 grade V elementary school students, for outdoor learning treatment was carried out on 20 students with the same level with different schools. The research method used in this research is experimental design. The data used in the study were the results of observations and students' formative test scores. The results of this study indicate that Science learning achievement of students using the outdoor learning model and students using indoor learning models who have high naturalist intelligence supported by statistical hypothesis testing, the value of Sig. (2-tailed) = 0.001 <  $\alpha$  = 0.05, then  $H_0$  is rejected, so it can be concluded that, there is a significant difference in science learning achievement between groups of students using outdoor learning models and groups of students using indoor learning models.



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## Introduction

Naturalist intelligence is a term that can describe the capacity of the mind. Naturalist intelligence can also be defined in various ways, including the ability to think abstractly, understand, communicate, reason, learn, plan, emotional intelligence, and solve problems. Naturalist intelligence is the intelligence possessed by all humans since the beginning of their life. Every child is gifted with the naturalist ability to be able to enjoy the natural environment in its entirety and be able to hone intelligence by stimulating its sensitivity to the surrounding natural environment (Suarca et al., 2016). Naturalist intelligence in children can be seen through its development by distinguishing between living things and inanimate objects (Barbiero & Berto, 2018).

In his book *Frame of Mind*, that intelligence can be defined as: 1) the ability to solve problems that occur in real life, 2) the ability to generate new problems to solve, 3) the ability to create something that will lead to appreciation in one's culture (Gardner, 2011). Gardner developed the concept of assessing intelligence through multiple intelligences, which views humans as not only judged by standard scores but by a measure of their ability to solve problems in human life, the ability to be able to generate new problems and to be able to solve them well.

Gardner also divides intelligence into two, namely biologically and psychologically. Biologically, intelligence will develop in accordance with natural growth, while psychologically it must be stimulated by the environment around the child. The term intelligence developed by Gardner is multiple intelligence, including: Musical intelligence, Bodily-kinesthetic intelligence, Logical-mathematical intelligence, Linguistic intelligence, Spatial intelligence, Interpersonal intelligence, Intrapersonal intelligence, Naturalist intelligent. Armstrong explained that the application of naturalist intelligence in learning is carried out by emphasizing natural learning, raising an attitude of ecological awareness, and caring for animals (Armstrong, 2009).

Naturalist intelligence is a combination of human traits which includes the ability to recognize, clarify flora and fauna and other natural objects as well as having sensitivity to the natural conditions of the environment. Students who have high naturalist intelligence will easily recognize, differentiate and categorize what is found in the school environment directly through outdoor learning activities. Why does the outdoor learning model affect student learning outcomes? This is because the outdoor learning model and naturalist intelligence are closely related and can make it easier for students to receive and store material information so that it will greatly facilitate students and can improve learning outcomes, in this case especially in science learning.

The project of Multiple Intelligence is to help students create a personal connection to nature and the outdoors, and help them develop into healthy and environmentally literate individuals who better understand and care about current and future environmental (Anderson, 2017), Therefore factors that can influence the student's multiple intelligence potential are stimulation and environment. Teachers' help and teaching media and methods can be used for this purpose (Darmawan & Hilmawan, 2020).

The guide to multiple intelligences learning programs can be used as an alternative to the implementation of millennium century learning (Mariyana & Zaman, 2019). Parents who develop their children's naturalistic intelligence love the environment so much that they want their children to love and protect the environment (Faridy & Rohendi, 2020).

Meanwhile, according to Husamah (2013), Outdoor Learning is an out-of-school activity that includes activities outside of class or school and in other free realms, such as: playing in a school environment, parks, farming / fishing villages, camping, and adventure activities, as well as development of relevant aspects of knowledge (Husamah, 2013). And Outdoor Learning is an effort to get closer to the real learning sources, namely nature and society (Adelia, 2012)

Effectiveness of science learning can be seen from the evaluation of children's learning results and their expression, enthusiasm or spirit of the children when following every learning process given by the teacher, and the materials that are supporting the learning process as well as the creativity and innovation of the teacher (Fatonah & Prasetyo, 2017). They improve children's skills for sharing their knowledge, expressing their feelings and making their own decisions without asking for help, which make them more successful in their lives. They also offer learning environments for experiments, discoveries and research. Children learn freely and have fun in a healthy environment, incorporating nature and stimulating all the senses (Yıldırım & Akamca, 2017).

Outdoor activities are one way to improve student learning capacity. Students can learn more deeply through the objects they face than if they study in a class that has many limitations. Furthermore, learning outside the classroom can help students to apply their knowledge (Lismaya, 2019). Outbound activities can stimulate children's interpersonal intelligence, bodily-kinesthetic intelligence, and naturalist intelligence (Sari et al., 2018).

The activities of the out-of-school learning environment can be organized in a long-term so that the nature of science can be explored in terms of different variables (Sontay & Karamustafaoğlu, 2018)

Students will be able to think critically, creatively and innovatively and have a good interpretation of the science learning material being taught because naturalist abilities and student participation spur students to think more optimally. Therefore, it is proven that the higher the naturalist ability and student participation, the more optimal the competence of students in science can be achieved (Yulianti et al., 2020)

Students engaged in outdoor learning have more positive attitudes toward school, feel more responsibility and ownership over school work, demonstrate improved confidence and self-esteem, and improved achievement in testing (Meighan & Rubenstein, 2018). There was an increase in Multiple Intelligences and student learning motivation through the application of the Demonstration with Outdoor Activities method (Lismaya, 2020)

Internal factors of students include health problems, disabilities, psychological factors (intelligence, interest in learning, attention, talents, motivation, maturity and readiness of students), and fatigue factors. While

external factors that influence the process and student learning outcomes include family, school and community factors (Nurhasanah & Sobandi, 2016)

That each intelligence on naturalistic intelligence, spatial-visual intelligence, and interpersonal intelligence has positive relationship with learning outcomes (Selaras et al., 2020)

Science learning outcomes are something that is obtained based on efforts in the process of changing the abilities and behavior of individual humans who interact with the environment through an activity or the results of experiences in learning elementary school students by using educational principles and learning theories to understand the natural surroundings, including objects. nature and man-made as well as the science concepts contained therein (Aldarmono, 2015)

Therefore student learning outcomes in this case natural science learning (IPA) are strongly supported by the outdoor learning model and the naturalist intelligence of these students. This is proven in previous research that the center learning model through outdoor learning has a significant effect on the development of science and creativity of children (Ismawati, 2019)

By incorporating outdoor learning regularly in a classroom, children are given the freedom to move and explore on a sensorial level that may promote positive learning abilities. Using the outdoor environment as a classroom setting can have an impact on children who are not successful in an indoor classroom setting (Cameron & McGue, 2019)

Outdoor Study Learning was better on increasing student learning outcomes with higher average learning outcomes compared with Indoor Study (Surbakti & Marpaung, 2018)

That the application of outdoor learning can be teacher use as an alternative to learning, so it is quite effective in developing science process skills and problem-solving abilities (Wahyuni et al., 2017). And The Outdoor learning has the potential to be at least as effective a method for science instruction as classroom teaching, and outdoor learning may be a successful strategy for student learning (Szczytko et al., 2018).

This research is very interesting because learning using the outdoor learning model that synergizes with the naturalist intelligence of students can affect excellent learning outcomes, because it is related to the natural intelligence possessed by each child and the strength that comes from natural wealth in this which is related with science learning in school.

## Method

The research method used in this research is experimental design. The method used in this research is quasi-experimental with independent variable (X), the first is the outdoor learning model and the second is the naturalist intelligence, while the dependent variable (Y) is the science learning result. Indoor learning treatment was carried out on 20 fifth grade students, SDN 1 Guwa Lor, Kaliwedi District, Cirebon Regency. Outdoor learning treatment was carried out on 20 fifth grade students of SDN 2 Ujungsemi, Kaliwedi District, Cirebon Regency.

The main data was obtained from the science learning achievement test instrument, class V ecosystem material in the form of multiple choices, while the data on students' naturalist intelligence levels was measured from the naturalist intelligence instrument. Supporting data were obtained from the observation instrument of learning implementation carried out by several observers to obtain data on the percentage of student learning achievement. In this study, two types of instruments were used, namely instruments to collect data on science learning outcomes and naturalist intelligence.

This study uses a mix research approach or a combination research approach (mixed methods). Mixed Methods Research is an approach to research that combines or combines quantitative and qualitative research methods (Creswell, 2014)

## Result and Discussion

Description of Naturalist Intelligence Based on Indicators for Students who Learn to Use Indoor Learning and Outdoor Learning is a combination of human traits which includes skills in recognizing, clarifying flora, fauna and other natural objects as well as having sensitivity to natural environmental conditions. The learning outcomes of students who use the outdoor learning method are higher than those who do not use this method (Rahyuni, et al., 2018).

The following is a description of the research results based on indicators of naturalist intelligence.

**Table 1.** Percentage of students' naturalist intelligence indoor learning and outdoor learning

Indicator	Indoor (%)	Outdoor (%)
Have sensitivity and use the five senses	67,50	74,17
Using the five senses to signify and clarify various things from the surrounding environment	73,50	72,83
Loves outdoor activities	67,50	71,50
like animals and plants	70,00	70,67
easily interpret what happens in the environment	69,00	72,50
have a high concern for the environment	64,83	69,17
create, own, or collect objects related to nature, whether in the form of books, journals, pictures, or specimens	62,00	69,50
like movies, videos, or books related to nature	65,83	69,00
have a high interest in the extinction of a species	64,67	72,33
easily learn the characteristics, names, categories, and data regarding objects or types found in nature.	66,00	71,67

**Table 2.** Results of Normality Test for Science Test Data

Class	<i>Shapiro-Wilk</i>			Conclusion	Information
	Statistic	df	Sig.		
Indoor learning	0,815	20	0,001	H <sub>0</sub> rejected	Abnormal distribution
Outdoor learning	0,905	20	0,052	H <sub>0</sub> rejected	Normal distribution

Based on the table above, it is known that the science test data for indoor learning classes are not normally distributed, and outdoor learning classes are normally distributed at a significant level of 0.05.

**Table 3.** Natural intelligence data normality test results

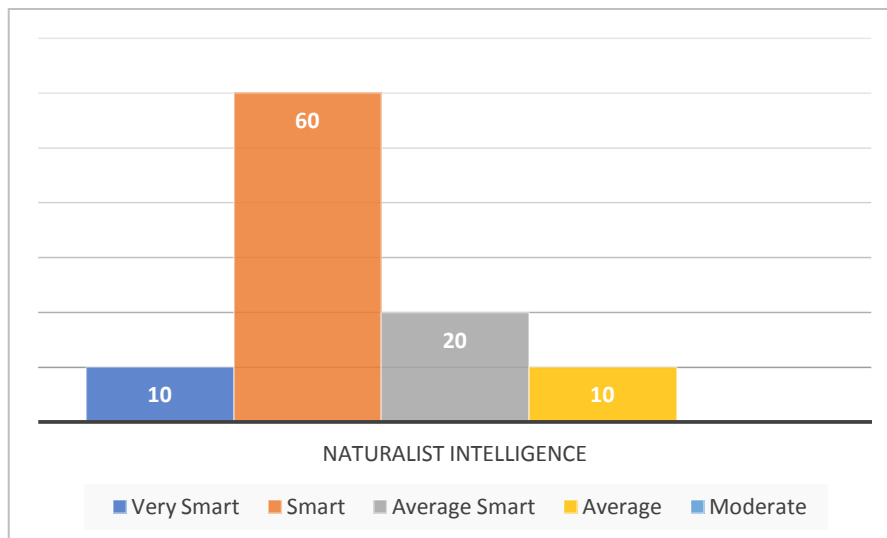
Class	<i>Shapiro-Wilk</i>			Conclusion	Information
	Statistic	df	Sig.		
Indoor learning	0,952	20	0,406	H <sub>0</sub> accepted	Normal Distribution
Outdoor learning	0,864	20	0,009	H <sub>0</sub> rejected	Abnormal Distribution

Based on the table above, it is known that the natural intelligence data for indoor learning classes are normally distributed, and outdoor learning classes are not normally distributed at a significant level of 0.05. Furthermore, testing the homogeneity of natural intelligence data using the Levene test.

**Table 4.** The results of the homogeneity test for natural intelligence data

Ability	<i>Levene's Test for Equality of Variances</i>		Conclusion	Information
	F	Sig.		
Indoor dan outdoor learning	0,033	0,858	H <sub>0</sub> accepted	Homogeneous varies

The table above shows that the data on natural intelligence for indoor learning classes and outdoor learning classes is homogeneous at the 0.05 significance level. Based on the results of the homogeneity and normality test above, it is known that the natural intelligence data for indoor learning classes is normally distributed, and outdoor learning classes are not normally distributed, and both have homogeneous variances, so that the statistical hypothesis test carried out is using a non-parametric statistical test, namely the Mann-Whitney U.



**Graph 1.** Description of students' natural intelligence in outdoor learning

The graph above shows that natural intelligence in the "smart" category is the highest in a class that learns using outdoor learning.

The discussion of the results of this study shows that there are differences in the scientific literacy skills of elementary school students between students learning with the ICT Flash media method and students learning with the ICT Power point media. There is an interaction between ICT media and critical thinking abilities to science literacy abilities of elementary school students (Prawira et al., 2018). In addition, the use of ICT power point media has a very good influence on science learning interests and outcomes in elementary schools (Elpira & Ghufon, 2015).

Based on the results of research that has been done, the results of student learning science using outdoor learning have a very good category, when compared with the learning outcomes of students using indoor learning.

Based on statistical analysis, the outdoor learning model provides excellent learning outcomes and naturalist intelligence, namely 10% of students who learn to use outdoor learning have naturalist intelligence with a very smart category. 60% of students who learn to use outdoor learning have naturalist intelligence with a smart category. 20% of students who learn to use outdoor learning have naturalist intelligence with the average smart category. 10% of students who learn to use outdoor learning have naturalist intelligence with the medium average category.

Science learning outcomes taught using the Outdoor Learning Model and Students taught using the Indoor Learning Model who have high naturalist intelligence supported by a statistical hypothesis test, the value of Sig. (2-tailed) = 0.001 <  $\alpha$  = 0.05 then  $H_0$  is rejected, so that It can be concluded that, there is a significant difference in science learning outcomes between groups of students who are taught using the outdoor learning model and groups of students who are taught using indoor learning.

## Conclusions

This study can describe student learning achievement using the outdoor learning model better than using indoor learning. Outdoor learning can make students have higher naturalist intelligence than students who use

indoor learning. And the group of students who used the outdoor learning model of science learning outcomes had significantly better results than the group of students who studied using indoor learning.

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