

## The Differences in Understanding of Students in the Mountains and the Coast in Recognizing the Types of Insects

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### **Abstract**

*This study aims to provide a description of how elementary school students in grade 2 recognize the types of insects through their existence in the nature around us. The method used in this research is semi-experimental research, the characteristics of experimental research in this study include manipulation and observation. Samples were taken from two populations, namely: elementary school students in mountainous areas and elementary school students in coastal areas. The research question is whether there are differences in understanding related to the material for elementary school students in mountainous and coastal areas? Based on the comparison between the D value in the table and the calculated D value, the D value is 0.216667. This value is smaller than the D value in the table of 0.582317. Thus the null hypothesis is declared rejected, while the alternative hypothesis is declared accepted. In this condition, it can be concluded that the level of understanding of material related to insects through their existence around us, there is a difference in understanding between elementary school students who are in mountainous locations or areas and elementary school students who are in coastal locations or areas.*

**Keywords:** *Differences in Understanding; Mountain Students; Coastal Students; Types of Insects*

### **Abstrak**

Penelitian ini bertujuan memberikan deskripsi terkait bagaimana siswa Sekolah Dasar kelas 2 mengenal jenis serangga melalui eksistensinya di alam sekitar kita. Metode yang digunakan dalam penelitian ini adalah penelitian semi eksperimen, karakteristik penelitian eksperimen dalam penelitian ini meliputi manipulasi dan pengamatan. Sampel diambil dari dua populasi yakni: siswa Sekolah Dasar di daerah pegunungan dan siswa Sekolah Dasar di daerah pesisir. Pertanyaan

penelitian apakah terdapat perbedaan pemahaman terkait materi untuk siswa Sekolah Dasar di daerah pegunungan dan pesisir? Berdasarkan perbandingan antara nilai D dalam tabel dengan nilai D hasil perhitungan, nilai D adalah 0,216667 dan nilai tersebut lebih kecil daripada nilai D dalam tabel sebesar 0,582317. Dengan demikian hipotesis nihil dinyatakan ditolak sedangkan hipotesis alternatif dinyatakan diterima. Pada kondisi ini, dapat disimpulkan bahwa tingkat pemahaman materi terkait serangga melalui eksistensinya di sekitar kita terdapat perbedaan pemahaman antara siswa Sekolah Dasar yang berada di lokasi atau daerah pegunungan dengan siswa Sekolah Dasar yang berada di lokasi atau daerah pesisir.

**Kata Kunci:** Perbedaan Pemahaman; Siswa di Pegunungan; Siswa di Pesisir; Jenis-Jenis Serangga

## A. Introduction

The very important role of education is to create an intelligent, peaceful, open and democratic life in order to balance the progress of science in all fields (Mujakir, 2015). The learning process is an activity that can result in changes in the attitude and mentality of each student (Arini et al, 2019). The term Natural Sciences or IPA is also known as science. The word science comes from the Latin *scientia* which means "I know". In English, the word science comes from the word *science* which means "knowledge". Science then developed into social science which in Indonesian is known as Social Science (IPS) and natural Science in Indonesian is known as Natural Science (IPA) (Fatimah, 2012).

Natural science is a subject that coordinates various sub-disciplines across subjects such as biology, physics, chemistry, geology, and space. Actually, natural science can also be combined with other subjects outside the field of natural science studies, because natural science is not just a combination of biology, physics, chemistry, and space but also an integration of natural science studies. Based on its characteristics, science learning can be viewed from two sides, namely science learning as a product of the work of scientists and science learning as a process as scientists work to produce knowledge (Waldrip et al, 2010; Tala, & Vesterinen, 2015). Learning science must be a scientific process, producing scientific products by conducting experiments and forming a scientific attitude (Sulthon, 2016; Fatimah & Kartika, 2013). The goal of natural science is a systematic way of knowing nature in the form of concepts, laws, principles and discovery processes (Amran & Muslimin, 2017).

Science is closely related to life. Almost all aspects of life are related to science. In fact, the rapid development of technology today is inseparable from the existence of science. Experts can develop various kinds of technology by utilizing scientific discoveries (Nihlah, 2017). The nature of science is the foundation for studying science (Tursinawati, 2013). Scientific knowledge is

acquired and developed based on a series of studies conducted by scientists in search of answers to the questions “what?”, “why?”, and “how?” of natural phenomena and their application in technology and everyday life (Rahayu et al, 2012).

Ecosystem is a functional unit of the environment built by living (biotic) and non-living (abiotic) components in the environment. Rice fields are one of the important ecosystems to support human life, because rice fields produce staple food for humans. In addition, in the rice field ecosystem there are also various types of insects (Rizal & Hadi, 2015).

Insects are one of the members of the animal kingdom that have the largest number of members. Almost more than 72% of animal members belong to the insect group. Insects can act as plant eaters (insects of this type are the most members), as parasitoids (living parasitically on other insects), as predators (predators), as carrion eaters, as pollinators (eg wasps and bees), and as transmitters (vectors). ) certain disease germs (Kukuh & Novy, 2007). Insects are a type of animal that is easy to find. One type of insect that is often encountered is flies. Flies are one of the insects belonging to the order Diptera which have a pair of membrane-shaped wings. Diptera comes from two Greek words meaning two and ptera meaning wing. Flies have cosmopolitan nature, meaning that the life of flies is found evenly on almost the entire surface of the earth. It is estimated that worldwide there are approximately 85,000 types of flies that are most detrimental to humans, namely the house fly (*Musca domestica*), green fly (*Lucilia sertica*), blue fly (*Calliphora vomituri*), and Latrine fly (*Fannia canicularis*) (Sari et al, 2014). ).

The existence of insects plays a very important role in an ecosystem (Ilhamdi, 2012; Ilhamdi, 2018). Dragonfly is one of the insects that has an important role for the sustainability of the ecosystem, namely acting as a predator and an indicator of environmental pollution. The existence of dragonflies in an environment can be used as an indication to see environmental conditions (Aswari, 2011). Dragonflies can be used as an indicator of clean water that is useful for monitoring the quality of water around the environment (Suaskara & Joni, 2020). Dragonflies in the breeding process always look for a clean aquatic environment. Polluted aquatic environmental conditions can cause disruption of the dragonfly life cycle which has an impact on decreasing the dragonfly population. Therefore, changes in dragonfly populations can be used as an initial step to signal the presence of pollution (polluted environment) (Koneri & Tallei, 2014). The habitat of dragonflies is quite widespread, such as rice fields, forests, gardens, rivers, and other places not far from springs (Herpina et al, 2015).

Aquatic insects are a group of insect organisms that part or all of their lives are in water. Some insect species are very susceptible and sensitive to

environmental pollution, while others can live and breed in polluted water conditions (Popoola & Otalekor, 2011). These groups of organisms can be benthic, periphytic, or free-swimming. In aquatic ecosystems, aquatic insects play a role in the nutrient cycle and are an important component of aquatic food webs (Jana et al, 2009).

Character education is very important for every student (child). The purpose of character education is to overcome student behavior (Gable et al., 2013), improve skills (Helterbran & Strahler, 2013), promote a good attitude (Napitupulu, 2019), and encourage the growth of social competence (Ugurlu, 2014), so that character education implemented in school, home, and the community environment aims to shape the good behavior, skills, attitudes, and social competencies of children. According to Par (2017), the value of goodness is a key objective of character education. The strength of the character of children in coastal areas is different from children who live in rural / mountainous areas (agrarian), and cities (urban). The difference is due to the environmental conditions of the area occupied. The results of Jennings, Mitchell, & Hannah (2014), Handayani & Brodjonegoro (2015), and Freeks (2015) concluded that the environment greatly influences character formation.

This study aims to provide a description of how elementary school students in grade 2 recognize the types of insects through their existence in the nature around us. Samples were taken from two populations, namely: elementary school students in mountainous areas and elementary school students in coastal areas. The research question is whether there are differences in understanding related to the material for elementary school students in mountainous and coastal areas.

## **B. Methods**

The method used in this research is semi-experimental research. Frenkel et al. (2012) said that "Experimental research is one of the most powerful research methodologies that researchers can use. Of the many types of research that might be used, the experiment is the best way to establish cause-and-effect relationships among variables". In general, the characteristics of experimental research in this study include:

### **1. Manipulation**

Researchers manipulate the independent variables by giving treatment. The treatment aims to achieve what the researcher expects in the research. The independent variable that was manipulated in this study was the learning model/method, namely the introduction of insect species through the natural surroundings.

## 2. Observation

After the treatment is given for a certain period of time, the researcher makes observations or measurements to determine the effect of the manipulation/treatment given to the variables studied. Observations were made through data collection in the form of tests.

The research design used is The one-shot case study design, the paradigm in this study is illustrated as follows:



Information:

X = treatment/treatment given (independent variable)

O = posttest (observed dependent variable)

This design was used in the study because there was a group that was given treatment, and the results were then observed. The treatment as the independent variable and the observed results as the dependent variable. While the sampling technique used for this design is purposive sampling. Samples were taken as many as 12 and 10 respectively from grade 2 elementary school students for mountainous and coastal areas.

While the hypothesis testing procedure uses the Kolmogorov-Smirnov method. Basically, the procedure for testing the hypothesis using the Kolmogorov-Smirnov method for multiple sample groups is focused on testing the validity of the null hypothesis, which essentially states that the first and second sample groups come from the same population. While the alternative hypothesis states that the first and second sample groups come from populations that are not identical or that one of them is higher or lower.

For multiple sample groups, the steps or procedures for testing the hypothesis that must be followed in the Kolmogorov-Smirnov method to determine the final conclusion include:

- a) Formulate the null hypothesis and alternative hypothesis
- b) Determine a certain level of significance
- c) Formulate test criteria

In testing the two-sided hypothesis, the null hypothesis is accepted if

$$D \leq D_{\alpha}$$

While the null hypothesis is rejected if

$$D > D_{\alpha}$$

- d) Calculating the value of D

If the hypothesis testing procedure through the Kolmogorov-Smirnow method has reached this stage, the value of D must be calculated through

several steps. The series of steps that must be taken to find the value of D are:

1. Record the observations in the table  
The result of the observation is the value of each member in the sample group.
2. Compile the cumulative frequency distribution of observations  
When the number of members from each category in each sample group has been recorded and entered into the table, then the cumulative frequency distribution of observations is compiled. For each frequency, the relative percentage value of each category is included. The display of the cumulative frequency distribution of observations along with their compiled relative percentages is marked with F1 for the first sample group and F2 for the second sample group.
3. Calculate the difference in the value of F1 with F2 and look for the value of D  
The value of the largest difference that is used as the value of D calculated results.

### **C. Results and Discussion**

The character of a human being is closely related to religion, environment and culture in which he grew up and grew up (Hafidhuddin, 2014). Highland communities are synonymous with rural areas. Highlands are parts of the earth's surface that are flat and located at an altitude of more than 600 meters above sea level (Language Center of the Ministry of National Education, 2008). The socio-cultural system of rural communities as a regular or constant interrelationship between individuals and individuals, between individuals and groups, as well as between groups and groups in relation to all human activities to cultivate and change nature, both as something that is learned, experienced, and built together. socially which includes ideas, values, and norms by community members so as to form a totality (Damsar & Indrayani, 2016). Characteristics of coastal communities have different ways in terms of knowledge, beliefs, social roles, and social structures. Meanwhile, coastal communities do not have many ways to solve problems present (Fatmasari, 2014).

Taylor in his book Damsar and Indrayani defines culture as the total complex of knowledge, beliefs, arts, morals, law, customs, and all other capabilities and habits acquired by a person as a member of society (Damsar & Indrayani, 2016). Horton and Hunt in their book Damsar and Indrayani define culture as everything that is learned and shared socially by members of a society (Damsar & Indrayani, 2016). The relationship between the social system and the cultural system is the interdependence of each other. The cultural system is an abstract from the social system (Damsar & Indrayani, 2016).

The character that accompanies student development also influences the way students understand the material given to students as learning material. These characters provide their own characteristics for students in understanding the material. In the education room, different colors will be found, between the characters of students in mountainous areas and students in coastal areas. The choice of words and the way of responding, as well as the pressure of the diction are very different.

This research is a semi-experimental which has the characteristics of manipulation and observation, the following is the treatment or manipulation given to the group used for the experiment.

### **Types of Insects Study**

#### 1. Wasp

Wasps are insects that build their own dynasty. The life of a wasp "family" begins with an adult female wasp that has been bred by a male wasp. This female wasp will make a nest made of paper consisting of chambers, or mud jars, or lay their eggs in the ground. Wasps can be found everywhere, because they are good explorers.

#### 2. Bees

Bees are widely known by humans through their role as producers of honey, nectar, or as pollinators. They benefit humans more, so humans have long tried to uncover the mysteries of life. Most members of bees are known as social insects whose colonies inhabit a hive. In one hive inhabited by hundreds of bees.

#### 3. Ants

Ants are found in almost all parts of the world's land, except in water. They have many types. Ants are social insects. Their behavior is often used as an example of the harmony that occurs in the insect world. There were never any fights among the nest's inhabitants. The caste system also applies in ant societies, as is the case with bees and termites. In an ant colony there is a queen ant, male ants with wings, worker ants and sometimes soldier ants. Each caste of ants has its own task related to the survival of the colony.

#### 4. Mosquito

Mosquitoes are not a foreign right for humans. This one insect is indeed annoying and painful, not only the sound is ear-piercing but especially the bite and the consequences. According to experts, female mosquitoes are more dangerous than male mosquitoes. It is the female mosquito that likes to suck the blood of humans or mammals, while the male mosquito feeds on nectar and plant fluids. In addition to sucking blood, the female mosquitoes also act as intermediaries for several types of diseases, such as dengue fever and malaria. Mosquitoes usually live not far from water or watery areas.

5. Flies

The house fly is perhaps one of the most familiar insects to humans. House flies often flock to food, they are black in color, fly fast and agile, and make a loud buzzing sound. Besides being known as nuisance insects, several types of flies are human friends because they act as predators of several types of insect pests.

6. Butterflies

Butterfly is a term used to describe a type of insect that has beautiful wings and generally forages during the day; slimmer body and at the end of the antenna are bumpy. Why are these insects hated by humans? Butterflies are hated by humans because of the actions of pre-adult insects (caterpillars) that often damage and destroy plants. They eat various types of plants and will never stop eating before entering the pupa stage and becoming an adult. They are so voracious that they don't need much time to spend some of their favorite plant parts.

7. Termites

A group of termites will live in a colony that forms a separate "city" and has a unique system of government. The caste system allows the colony to have a good and regular division of labor. The termite caste system includes a termite queen and king whose only job is to reproduce throughout their lives. Worker termites consisting of termite nymphs have the task of serving food and housing needs for termite children, termite queens and kings, and soldier termites. Soldier termites have the task of defending the sovereignty of the colony.

8. Dragonfly

If you have time, try taking a walk around a river, lake, or rice field that is quite watery. You will find a nimble insect, slender body, red, yellow or green with black stripes, which swiftly fly to and fro like an eagle snatching its prey. That's an insect called a large dragonfly that roams around us a lot.

Following are the results of the answers to the post-test questions that were done by students related to the material on knowing the types of insects through their existence in the nature around us related to this experimental research. Based on the posttest related to the material given to 22 students, the posttest scores were obtained in the following categories:



Table 1.  
Posttest Results

Student Posttest Score Category	Elementary School Location	
	Mountains	Coastal
Very High	5	2
High	4	3
Currently	1	2
Low	1	3
Very Low	1	0
Total	12	10

From the data displayed in the table, it can be seen that the posttest score category for students in mountainous areas is the same as the posttest score category for students in coastal areas. Thus, the formulated null hypothesis states that the posttest score category of students in mountainous areas is the same as the posttest score category for the rest of the coastal areas. Meanwhile, the alternative hypothesis states that the posttest score category for students in mountainous areas is not the same as the posttest score for students in coastal areas. So, if formulated symbolically the two hypotheses are:

$$H_0 : \mu_{\text{Category of posttest scores for elementary school students in mountain}} = \mu_{\text{Category of posttest scores for elementary school students in coastal}}$$

$$H_1 : \mu_{\text{Category of posttest scores for elementary school students in mountain}} \neq \mu_{\text{Category of posttest scores for elementary school students in coastal}}$$

In this study, the significance level used was 5%. On the basis of the significance level, a D value in the table should be calculated. Because the applicable significance level is 5%, the value of D in the table is

$$1,36 \times \sqrt{\frac{12 + 10}{12 \times 10}} = 1,36 \times 0,428174 = 0,582317$$

The D value of 0.582317 is the basis for the formulation of the test criteria and the final conclusion in this study. Thus, the hypothesis testing criteria applied in this study is that the null hypothesis is accepted if

$$D > 0,582317$$

While the null hypothesis is rejected if

$$D < 0,582317$$

Furthermore, the value of D must be calculated through several steps. The series of steps taken to determine the value of D is shown in the following work table:

Table 2.  
Work Table

Student Posttest Score	Elementary School Location			
	Mountain (F1)		Coastal (F2)	
Category				
Very High	5	0.416667	2	0.2
High	9	0.75	5	0.5
Currently	10	0.833333	7	0.7
Low	11	0.916667	10	1
Very Low	12	1	10	1

Table 3.  
Calculation of D Value for Multiple Sample Groups

Student Posttest Score	Category of Elementary School Student		Difference F1 – F2
	Mountain Percentage (F1)	Coastal Percentage (F2)	
Category			
Very High	0.416667	0.2	0.216667
High	0.75	0.5	0.25
Currently	0.833333	0.7	0.133333
Low	0.916667	1	-0.08333
Very Low	1	1	0

From the calculation steps carried out through the help of the table above, the difference in the relative percentage value between the categories of posttest scores for elementary school students for mountainous and coastal areas is 0.216667. The difference value of 0.216667 is the calculated D value.

#### D. Conclusion

Based on the comparison between the D value in the table and the calculated D value, the D value is 0.216667. This value is smaller than the D value in the table of 0.582317. In this condition, it can be concluded that the level of understanding of material related to insects through their existence around us, there is a difference in understanding between elementary school students who are in mountainous locations or areas and elementary school students who are in coastal locations or areas. This study suggests that other researchers conduct more in-depth research on this difference, it could be related to learning methods, or the level of material selection.

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