

POLA PEMAHAMAN KONSEP SISWA SMP NEGERI 9 CILACAP TERHADAP EKOSISTEM ESTUARIN (STUDI KASUS *OUTDOOR EDUCATION* DI SMP NEGERI 9 CILACAP MELALUI PEMBELAJARAN EKSPERIMEN)

The Patter of Students' Concept Understanding Toward the Estuarin Ecosystem (Case Study Outdoor Education in SMP Negeri 9 Cilacap-Indonesia by Exsperimental Learning)

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Abstracts- This research aimed to know the pattern of students' concept understanding toward the estuarin ecosystem. This research was done at *SMP Negeri 9 Cilacap-Indonesia*. This type of research is True Experimental Design with design research is control group pretest-posttest. As the population in this research were all grade students of *SMP Negeri 9 Cilacap*. Sample of this research consisted of two groups that is: experimental and control. Analysis of the results of research conducted through Hierarchical Cluster test. From the test results on the first activity with Hierarchical Cluster to control group has established a pattern of understanding the concept of students as follows: accuracy concept, attributes concept, abstractness concept, inclusiveness concept, conjunctive concept, relational concept, disjunctive concept become abstractness concept, attributes concept, relational concepts, conjunctive concept, accuracy concept, inclusiveness concept, disjunctive concept. In the experimental class has established a pattern of understanding the concept of students as follows: accuracy, attributes, abstractness, conjunctive, relational, disjunctive, inclusion become: connecting, attributes, relational, abstractness, inclusiveness, disjunctive, accuracy. From the test results on the second activity with Hierarchical Cluster to control group has established a pattern of understanding the concept of students as follows: relational concepts, conjunctive concept, disjunctive concept, inclusiveness concept, attributes concept, abstractness concept, accuracy concept become the concept of inclusiveness, relational, abstractness, conjunctive, attributes, accuracy, disjunctive, and at experimental group that is: relational, conjunctive, disjunctive, attributes, abstractness, accuracy, inclusiveness become inclusiveness, relational, accuracy, conjunctive, attributes, disjunctive, abstractness. It can be inferred pattern of understanding the concept of students at *SMP Negeri 9 Cilacap* about estuarine ecosystems do not follow the pattern of theoretical stages. This is because the student have different of the pattern of thoughts, ideas, and understanding. In general, all students' thinking patterns only focuses on the correct answer.

Keywords: *pattern of concept understanding, estuarine ecosystem, secondary school*

INTRODUCTION

The implementation of outdoor education depends on the purpose and objectives of the teaching. In general, outdoor education activities carried out in the environment, whether the environment around the school and outside of school. Outdoor education is conducted outside the school in general contain material relating to the natural surroundings. One material is the relationship between the environmental with humans, and the relationship others the environment. Field of outdoor education studies may include all matters

relating to natural phenomena they are in the classroom or around the neighborhood the school in the school or outside of school. The field studies at the level of secondary education in Indonesia studied in natural science. Natural Science is science related to how to find out about natural phenomena systematically. Therefore, science can be a process of discovery related to the concept of nature and natural phenomena that exist in it. One of the activities of the discovery process in learning science concepts is considered suitable learning experiment. The process of



knowledge discovery science concepts related to natural phenomena would be better if the study was conducted in nature and based experiments. The application of outdoor education through experimentation can assist students in understanding science concepts. One of them is the concept of the material estuarin ecosystem (Asmani, 2012). Experimental learning emphasizes learning activities of students in finding facts, principles, and or concepts independently (Palendeng, 2003). The activities of the facts, principles, and concepts independently or on students occurs through seeing, observing, comparing, identifying, interpreting, classifying, correlation between friends, and communication/discussion between friends in one group or in other groups (Rahayu & Tumisem, 2012). According to Bunting (2006) outdoor education as a method to connect the three domains of learning ability of students: cognitive, affective and psychomotor (Bunting, 2006). The ability of the students in the cognitive aspects that will be gained through outdoor education include: increasing the knowledge and understanding of materials, concepts, processes and principles of science. In the process of improving the cognitive ability to apply the concepts, processes and principles of science in real conditions. In the affective aspects can enhance motivation, communication skills and awareness of the environment, while the psychomotor aspects can improve science process skills by implementing processes sciences scientifically in real life situations. Thus the results can improve the understanding of outdoor education science theoretical concepts, practical and able to develop scientific skills and attitudes that are environmentally friendly (Lieberman & Hoody, 1998). Phyllis in Bunting (2006) explains that outdoor education can create

a relationship that is comprehensive (holistic) between students and students with the natural environment and social environment. This will form the character of students near and love for the natural environment and social environment

Character is produced by students in understanding the concept of outdoor learning as contextual learning. *SMP N 9 Cilacap* is the only junior high school in *Cilacap* is located in the estuarin ecosystem. Estuarin ecosystem in Cilacap-Indonesia is dominated by mangrove vegetation (*Rizophora appiculata* and *Rizophora mucronata*), so it is often referred to as vegetation/mangroves. Mangrove forests are one of the biotic components that were position as producers (autotrophy organisms) in the estuarin ecosystem. The biotic components have a good relationship of interdependence with other biotic components (heterotrophic organisms) and a biotic component. Interdependence relationships between components in the mangrove ecosystem in the sea waters make *Cilacap* be fertile. Thus the estuarin ecosystem can be a source of learning for the material and the media ecosystem. The materials ecosystems studied in *SMP N 9 Cilacap* location surrounded by brackish waters caused the school can only be reached by water transportation. Laboratory facilities in *SMP N 9 Cilacap* pretty good, so much is done based science learning laboratory. The application of laboratory-based learning strategies many changes done to the material substance, material classification, scientific performance, acids, bases and salts, so that the learning strategy have not been able to improve students' understanding of the concept of the concept of the material that cant be practiced in the laboratory. It is based on information known to science teachers who said that the ability of



students' understanding of concepts in *SMP Negeri 9 Cilacap* on ecosystems material from the last five years is very low. Low ability students' understanding of the concept is also demonstrated by the results of the daily tests on 2011-2012 school year is still low at 75% of students still scored below the minimum completeness criteria 70.

RRESEARCH METHODS

Research activities was carried out from January to March 2013. The timing of the study was determined by the effective learning time and limited. The place of research activities is *SMP Negeri 9 Cilacap*. The selection of study sites was based on *SMP Negeri 9 Cilacap* was located around the estuarine. The population used in this study was all students *SMP Negeri 9 Cilacap*. Determination of the population based on the material to be delivered in research activities. The material presented in this activity is the concept of the ecosystem.

The sample in this study consists of two classes: experimental class and control class. The samples were taken by clustering. This research is a type of research quasi experimental Designs. The design of this study using the One-group pretest-posttest design that each group either the control group or the experimental group done a pretest (matter before treatment) and posttest (matter after treatment). This is due to One group pretest-posttest design can be used to determine more accurately to the results of treatment by comparing the activities between the results of the pretest with posttest results. The instrument used in this study is a written test in the form of essays and multiple choice.

RESULTS AND DISCUSSION

The results of the analysis of the pre-test in the control group showed an average score of the concept of student attributes = 3.5; concept conjunctive = 2; disjunctive concept = 0.5; relational concept = 3.5; concept abstractness = 1.5; concept of inclusiveness = 4.5; and the concept of accuracy = 3.5. The experimental group showed a concept attributes = 2.5; concept conjunctive = 2; disjunctive concept = 1.5; relational concept = 2.5; concept abstractness = 2; concept of inclusiveness = 3.5; and the concept of accuracy of 2.5. **Figure 1** show the results of the analysis of the pre-test in the control group. Based on the results of these calculations both the control group and the experimental group had the best understanding of the concepts occurred in the understanding of the concept of inclusiveness.

The results of the analysis of the post-test in the control group showed an average score of the concept of student attributes = 3; concept conjunctive = 5; disjunctive concept = 2.5; relational concept = 6; concept abstractness = 3; concept of inclusiveness = 5.5; and the concept of accuracy = 5. The experimental group showed a concept attributes =6.5; concept conjunctive = 5.5; disjunctive concept = 3; relational concept = 7; concept abstractness = 3.5; concept of inclusiveness = 6.5; and the concept of accuracy of 5.5. **Figure 2** show the results of the analysis of the post-test in the control group. Based on the results of these calculations both the control group and the experimental group had the best understanding of the concepts occurred in the understanding of the relational concept.



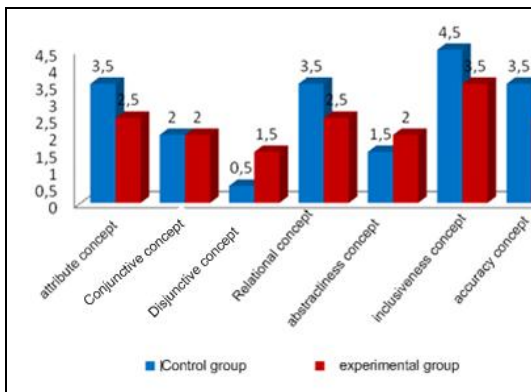


Fig 1. Comparison of pre-test results of the students' understanding of the concept of the estuarine ecosystem between Experimental Group-Control Group.

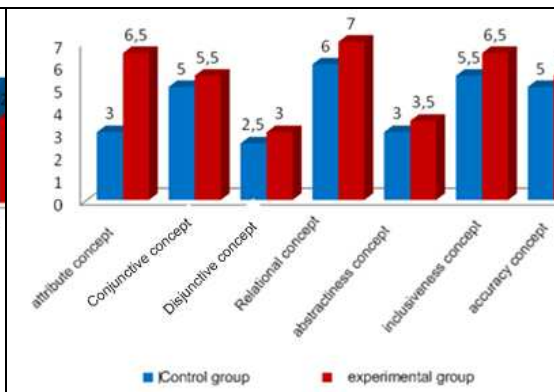


Fig 2. Comparison of post-test results of the students' understanding of the concept of the estuarine ecosystem between Experimental Group-Control Group.

On **Figure 3a** shows Preliminary results of Hierarchical Clustering analysis in control group about students' understanding of the concept of the estuarine ecosystem concept has a concept hierarchy with interlocking sequence starting from the concept of conjunctive-relational to the abstract concept-inclusiveness (stage 1), continued to disjunctive concept (phase 2) and then to concept-accuracy concept (stage 3). While at the end of the study has hierarchical concept as **Figure 3b**: starting from the concept of accuracy-inclusiveness into a relational concept (stage 1), continued to disjunctive concept (stage 2) and then to the concept of conjunctive-abstract-attribute (stage 3).

On **Figure 4a** shows the results of a preliminary analysis of learning in the experimental group using Hierarchical Clustering about students' understanding of the concept of estuarine ecosystem concept as follows: starting from concept of attribute-conjunctive to accuracy concept (stage 1), continues to disjunctive-relational concept (stage 2) and then forwarded to the abstract concept-inclusiveness concept (stage 3). At the end of the students' understanding of the concept hierarchy learning starts from the concept attributes

to the concept as **Figure 4b**: relational (stage 1), then all inclusive concept (stage 2) proceed to the concept of conjunctive-accuracy (stage 3) and evolved into the concept of a disjunctive (stage 4).

continued to disjunctive concept (stage 2) and then to the concept of conjunctive-abstract-attribute (stage 3)

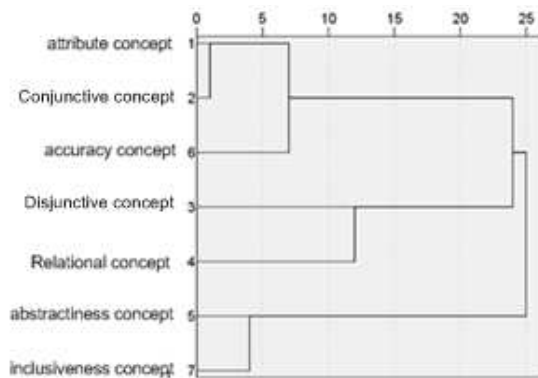


Fig 4a. Understanding the concept of the students hierarchy in experimental group before outdoor education to the estuarine ecosystem concept

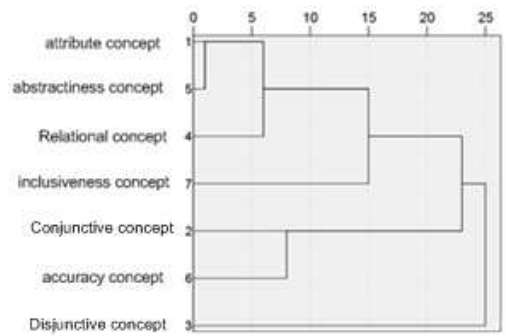


Fig 4b. Understanding the concept of the students hierarchy in experimental group after outdoor education to the estuarine ecosystem concept

On **Figure 5** show as theoretically stage/hierarchy of concepts built by the students based on logical thinking generally starts from the concept of attributes (1)

→concept of conjunctive (2) →disjunctive concept (3) →relational concept (4) → concept of abstractness (5)→ concept of inclusiveness (6) →concept accuracy (7).

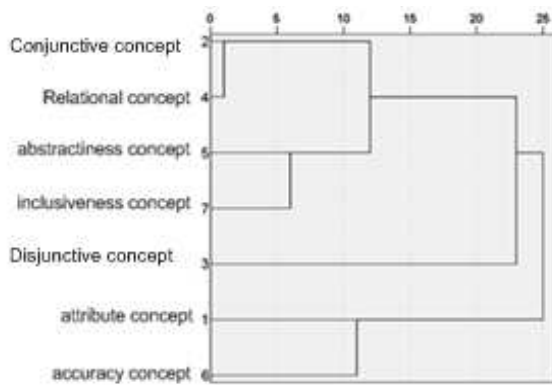


Fig 3a. Understanding the concept of the students hierarchy in control group before learning lectures to the estuarine ecosystem concept

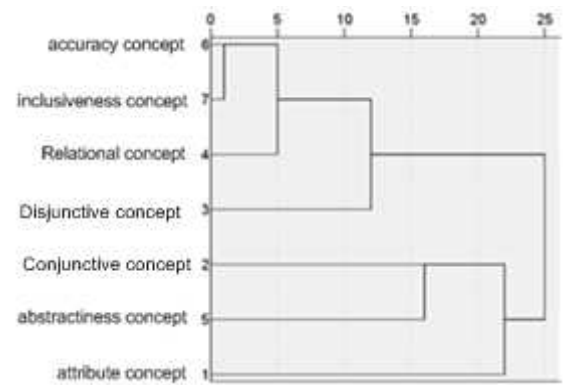


Fig 3b. Understanding the concept of the students hierarchy in control group after learning lectures to the estuarine ecosystem concept

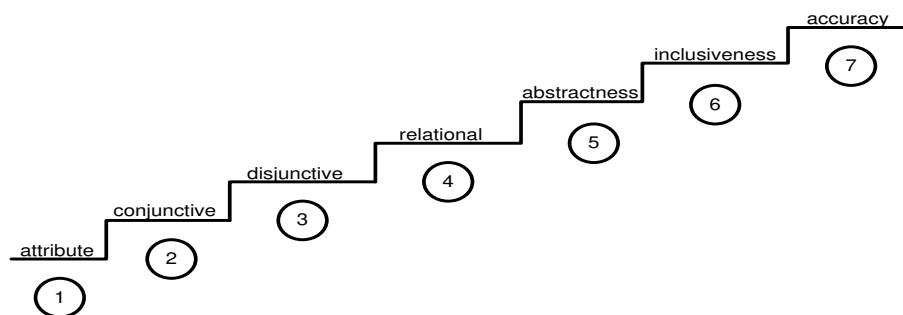


Fig 5. Hierarchy Understanding Students In Theoretical Concepts (Dahar, 1989)



Based on the analysis using the Hierarchical Clustering above the understanding of the concept of students in the experimental class and the control class estuarine ecosystem before and after the study carried out has a different hierarchy, and does not correspond theoretically as **Figure 6**. Based on Figure 6 the experimental class had more regularity than the concept of class controls both before

and after learning. This is due to the ability of each student to understand the different concepts. This difference is due to the students' thinking skills: the ability to think students are influenced by experience gained. The ability of students to understand the concept varies with the level of control ranging from less, minimum, optimum and maximum (Djamarah, 2006).

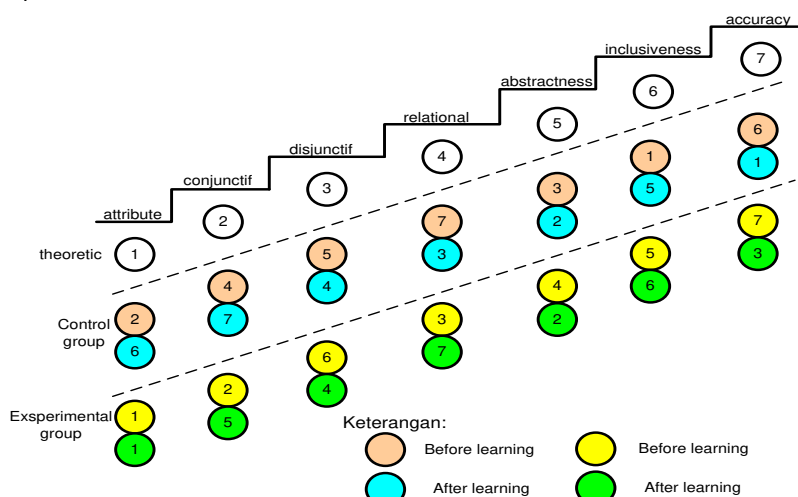


Fig 6. Comparison Concept Hierarchy Understanding Students in Theoretical and research results

CONCLUSION

Based on the results research was obtained the pattern of students understanding concept can not be determined theoretically. this happens because the brain development of students to think logically have change over time. Brain development of student is influenced by factors include: genetics, experience, environment, friends, and how to teach teachers.

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