



Indonesta University of Education Serang Campus, Indonesta

# PROCEEDINGS The 2<sup>nd</sup> International Conference In Basic Education and Early Childhood "Enhanding Teaching and Learning Processes"

# SERANG, APRIL 15 2017



# PROCEEDINGS CONFERENCE THE 2<sup>nd</sup> INTERNATIONAL CONFERENCE ON BASIC EDUCATION AND EARLY CHILDHOOD

**Theme:** "Enhancing Teaching and Learning Processes"

# **Keynote Speakers:**

Prof. Dr. Leslie Barratt, Indiana State University Prof. Dr. William Barratt, Indiana State University Chi Cheng, Wu, Ph.D, Tainan University of Technology Dr. Dinn Wachyudin, Universitas Pendidikan Indonesia

Articles of the conference: all on the list

# INDONESIA UNIVERSITY OF EDUCATION SERANG CAMPUS APRIL 15 2017





# PROCEEDINGS THE 2<sup>nd</sup> INTERNATIONAL CONFERENCE ON BASIC EDUCATION AND EARLY CHILDHOOD

*"Enhancing Teaching and Learning Processes"* Indonesia University of Education Serang Campus

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Good morning, ladies and gentlemen.

Greating to all participants and welcome to Indonesia University of Education, Serang Campus.

The International Conference on Basic Education and Early Childhood 2017: Enhancing Teaching and Learning Processes is the  $2^{nd}$  annual conference that we have conducted since 2016. The goals of this conference are to give international educators the opportunity to share ideas and form networks while working together on challenging education for future change. It is anticipated that the exchange of ideas and research findings will contribute greatly to futur generations.

In Indonesia, and in many other parts of the world, education reform continues. Globalization has the big impact on education reform. To adopt this tendency properly, we have to check the existing education systems. This conference provides with good opportunities to share knowledge, practices and plans in education reforms towards the conference targets. International character of this conference specially gives us the chance to consider globalization.

On behalf of the, Indonesia University of Education, Serang Campus, I would like to express my gratitude and my sincere appreciation to the guest speakers and organizing committees for their efforts. I also would like to thank all delegations and participants who come from afar to join this event.

I hope the prosperous education will not stop developing as far as the network we form is concerned. The pace of growing should move through the fast changing world as we all expected.

Finally, let's listen attentively to the Conference. I hope you enjoy the Conference. Thank you.

Serang, 15 April 2017 Best Regards,

Tatang Suratno, M.Pd.



# **SCHEDULE**

Date /Time	Activity	Note
Saturday 15 April 2017		
07.20 - 08.20 08.20 - 08.40	Registration Music and Dance Performance UPI Serang Students / ANzni	Aula Timur (East Aula) UPI Ms Yuli Fitriyani, Ms Fathihaturrosyidah, Mr. Tri Ilma
08.40 - 09.00	Cultures Thai Traditional Dance Performance	Thai Guest
09.00 - 09.10	Opening Ceremony UPI Serang Conference	Mr. Tatang Suratno Dr. Herli Salim
09.10 - 09.25	Declaration of ASPENDAS and ASPENDAUD	
09.25 - 09.45	Photo Session	
00.45 10.15	Plenary Session I	M. T. H
09.45 - 10.15 10.15 - 10.45	Prof. Leslie Barrat Dr. Dinn Wachyudin	Mr. 1ri lima Ms. Fathihaturrasyidah
10.45 - 11.15	Question and Answer	initia initia anna anna anna anna anna a
11.15 – 13.00	Lunch Break	Committee
	Parallel Sessions	
13.00 - 14.30	Each Presenters will present the papers	Classrooms in UPI Serang Campus
	Plenary Session II	
14.45 - 15.15	Prof. William Barrat	Mr. Tri Ilma
15.15 - 15.45	Dr. Chi Cheng Wu	Ms. Fathihaturrasyidah
15.45 - 16.15	Question and Answer	
16.15 - 16.30	Closing Ceremony	Mr Tatang Suratno, Mr Tri Ilma



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# DEVELOPMENT OF THE BASIC CONCEPTS OF MATHEMATICS USING OUTDOOR LEARNING IN PRIMARY SCHOOL

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#### Abstract

This article aims to explain the development of the basic concepts of mathematics by using learning outdoor in elementary school. The method used is the method of literature review. The results obtained are the basic concepts of mathematics can be understood by elementary school students through learning outdoor. The basic concepts of mathematics is understood by students through using outdoor learning is more meaningful. In addition, the students' knowledge is becoming more widespread.

Keywords: Basic Mathematical Concepts, Outdoor Learning.

#### **INTRODUCTION**

Generally, the mathematics learning activities in elementary schools is done in a formal classroom. Student sitting position with both hands placed neatly on the table and eyes directed to the teacher who told mathematical concepts. Ruseffendi (1991) explains that during this time in mathematics teaching in the classroom, in general students learn mathematics just been told by his teacher. Students tend to imitate what was described by his teacher. Mettes (1979) explains that in mathematics learning only modeled and recorded how to resolve a matter that has been done teacher. Furthermore, Slettenhaar (2000) explains that the current learning model, generally the activity of students just listen and watch the teachers perform mathematical activity.

The Learning patterns has several drawbacks, including students' understanding of mathematical concepts is weak. Permana (2010) explains that the low yields caused by weak a basic concepts of mathematics. Students do not understand fully the meaning of a mathematical concept. Students are more likely to memorize their understanding of a concept. As weakness students understand basic concepts of mathematics which a piece of 1/2 is understood as consisting of numbers 1 and 2, one located at the top and 2 located at the bottom. Learning is not supported by the mental development of primary school children who are in the stage of concrete thinking. Hartono and Sunarto (2008) explains that the primary school students aged 7-11 years are in a stage of mental development (cognitive) Concrete Operations. At this stage, students can perform various tasks are concrete, but difficult to perform tasks in the abstract. Meanwhile, teachers use learning with formal approach that puts mathematics as abstract knowledge.

Discrepancy between learning approach with the stage of development of mental (cognitive) students causing problems in mathematics in the primary school is a students' understanding of the weakness of the basic concepts of mathematics. Soedjadi (1999/2000) describes the mathematics learning problems in primary school that weak students in understanding the concepts in mathematics. The basic concept of mathematics is necessary for primary school students as a basic to be able to learn other concepts in mathematics. Failure to equip teachers in the basic concepts of mathematics in students would adversely affect the control of other mathematical concepts. Because mathematics is a science that includes linkages of concepts. Ruseffendi (1991) explains that mathematics is a science of the organized structure.



Therefore, changes in the mathematics learning in primary schools from the formal approach to an approach that can bring the atmosphere of concrete. The learning is outdoor learning. According Husamah (2013), outdoor education is an education that takes place outside the classroom that involves experience and requires the participation of students for the challenges of the adventure that became the basis of activities outside the classroom. Through learning outside the classroom, the basic concepts of mathematics can be shown concretely through the activities and objects in everyday life so as to help students understand the basic concepts of mathematics. Understanding the concept is part of mathematical competence that needs to be mastered by students. Kilpatrick, Swafford, and Findel (2001) describes a mathematical competence (mathematical proficiency) is the conceptual understanding that comprehension of mathematical concepts, operations, and relations.

Cantrell and Knutson (2006) states that the use of technology in outdoor learning to assist students in conducting investigations in natural science. Moser and Martinsen (2010) explains that the environment outside the classroom can make play activities while learning. Martin, Falk, and Balling (1981) which states that learning outside the classroom a positive effect on student behavior. They say the effects of environment on student behavior during field trips are considered to be solely due to novelty.

## **RESEARCH QUESTION**

Is the basic concepts of mathematics can be understood by premary school students through using outdoor learning?

#### METHODOLOGY

This study uses literature study. According Subiyanto (1993), the study of literature is one of the research methodology that emphasizes the literature as an object of study. Meanwhile, according to Eckhardt & Ermann (1977), the study of literature is a picture of our view of the problem examined. Libraries used methods supported by logical reasoning, systematic and accurate. Nazir (2005) explains that the study of literature, in addition to looking for a secondary data source that will support the research, it is also necessary to know the extent to which science-related research has progressed. Method amplified library with logical reasoning. Furchan (1982) explains the reasoning (inductive and deductive thinking method) as a way to obtain the truth. Truth be studied in this paper is the relationship between learning outside the classroom with the understanding of the basic concepts of mathematics premary school students.

The process of research on the study of literature as follows (Subiyanto, 1993): a. Collecting materials (in the library) and the formulation of a research idea, b. Making research proposal, c. Compilation of data, data classification, data analysis, and preparation of the framework of analysis of the facts that have been discovered, and d. Formulating conclusions. Analysis of studies using objective analysis approach by referring to the study of literature (Subiyanto, 1993).

#### **RESULT AND DISCUSSION**

Gagne in Ruseffendi (1991) explains that the concept in mathematics is an abstract idea that lets us classify objects into an example and not an example. Some of the concepts of mathematics in primary schools as follows: integer, primes, numbers fractions, triangle, square, parallelograms, circles, cubes, blocks, tubes, limas, and angle. The circle is the set of points that have the same certain distance to a certain point (Mulyana, 2001). The concept of the circle can make into the circle with not a circle. Such as: the triangle is not a circle, because it does not have the same distance to a certain point. While the concept according to



Dienes is a mathematical structure consisting of: a. pure mathematical concepts, b. notational concepts, and c. applied concepts (Ruseffendi, 1991). Examples of pure mathematical concept is the 'root of numbers'. Examples of notation concept is ' $\neq$ ' is a symbol of the 'not the same'. Examples of application concept is the 'corner' which can be used to calculate the area of a triangle as well as in everyday life.

Concept in mathematics can be shaped basic concepts. From the basic concept can form other concepts in mathematics. As the concept underlying the concept of summation integer integer multiplication as an integer multiplication is repeated addition. The concept underlying the concept of function set. Because the concept of a function is a special relationship between members of the two sets. The concepts is function is of fundamental importance to the learning of mathematics (Hitt, 1998). According to Lucier and Zakon (2001), the basic concepts of mathematics are: a. some set theoritical notions, b. the real number system, c. vector spaces. Meanwhile, according to Jones (1974), the basic concepts of mathematics consists of: a. logic, b. the positive integers and zero, c. negative integers, rational and irrational numbers, d. algebra, e. graphs, and f. permutations, combinations, and probability. According Eves (1990), the basic concepts of mathematics consists of: a. the real number system, b. sets, c. logic and philosohy, d. algebraic stucture, e. formal axiomatics. Meanwhile, according Mulvana (2001), the basic concepts of mathematics in primary schools consist of: numbers, factors guild greatest (FPB) and the least common multiple (KPK), equations and inequalities, points, lines, curves, build space, angles, diagram, symmetry, odds ratios, and measurement.

Ruseffendi (1991), mathematical concepts can be studied, when the representation starts with concrete objects that diverse. So that the representation is an indicator of understanding of the concept. Mulayana (2009) explains that one of the indicators of conceptual understanding is that it can represent mathematical situations in a variety of different ways and learned to use different representations that can be used for different purposes.

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Learning that accommodate activities related to concrete objects is done outside the classroom is a outdoor learning (Husamah, 2013). Concrete objects as a medium to bring students on mathematical concepts. In addition to concrete objects, outdoor learning using games as a medium that mathematical concepts can be understood easily by the students. Supendi and Nurhidayat (2014) mentions 50 games that can be used as a means or medium for learning outside the classroom. The game can be divided into two types of active play and passive game. Active games, actors are actively involved in the game itself. While passive game, the offender acts just spectators. The games include: the Eiffel Tower, run a foot race, chain messages, cobwebs, elephants and ants, mice and cats, hand in hand, and the paper ball. Through the game, students can get to know the concepts in mathematics. As the game 'Spider Webs' can help students understand the concept of rectangle. Because cobwebs made a four- square shape rectangle that must be passed by the child without touching the net. An understanding of the concept is formed through the connection of various things seen by the students. The link between the ropes, movement, and rules. Kilpatrick, Swafford, and Findel (2001) describes the level of students' conceptual understanding each other is related to the number and breadth of the connection they know. Understanding the concept through the attribution of various things named as relational understanding. Skemp (1976) explains that relational understanding is to associate something with other things the right way.



End of the game 'Spider Webs' are obtaining an understanding of the rectangle that is expressed in a statement about the concept of a rectangular flat wake bounded by the intersection of four lines. The statement was as limiting the concept of rectangle. Barring a concept called definition. Soedjadi (1999/2000) explained that the definition of a concept is a phrase that can be used to limit the concept. He also explained that there are three types of definitions: a. Analytic definition, b. Genetic definition, and c. The definition of the formula.

Priest in Husamah (2013) explains that educaton Outdoor Education is an experimential method of learning by doing, the which takes place primarily through exposure to the out-of-doors. In outdoor education, the emphasis for the subject of learning is places on the relationship: relationship concerning human and natural resources. According Yuliarto (2010), the underlying concept of outdoor learning approach as follows: 1. The world is the world of children's play, 2. Education has not put the child as a subject, and 3. The child's age is the age of the most creative in human life.

# DISCUSSION

Husamah (2013) describes the steps of outdoor learning as follows: 1. The preparation Step 2. Execution Step, 3. Follow-up Step. Step Preparations Step contain activities: a. Determining learning objectives, b. Define the objects to be visited, c. Determine how student learning during the visit, d. Preparing licensing, d. Technical preparation. Execution Step contains the following: a. Explanation by the officer, b. Students formed groups, c. With the guidance of the officer, the students observe objects, d. The students discuss the results of their study on a group, e. Gratitude to the officers and leaders of the visited objects. Followup action will contain activities: a. Review and discuss the results of study of the environment, b. Asked for his impressions of students, c. Summing up the acquired content and instructional materials associated with the field of study, d. Teachers provide an assessment of student learning activities, e. Teachers give advanced tasks, such as housework, may be a bouquet with impressions obtained from the student's learning activities.

Outdoor learning can serve as a learning type of concept formation. Ruseffendi (1991) put the type of learning is a two-level concept formation before the type of learning problem solving and five levels above learning cues. Concept formation through learning outside the classroom through the process: a. Abstraction, b. Idealization, and c. Generalization. Furthermore, Ruseffendi (1991) explains that abstraction is the understanding through observation of the properties jointly owned and traits that are not owned. Suhena (2009) explains that assimilation is the process of absorption of new information into the mind. Accommodation is the process of preparing the structure of the mind with new information, so the information has no place.

On a bicycle wheel observation activities, students, motorcycle tires, and tires, students can understand the similarities of the three types of the vehicle tire which has a center with the same distance between the center of the tire of the vehicle. Results of abstraction in the form of equity at the third wheel of the vehicle that leads to the sphere the same tires that were not considered equal bulatannya kemulusannya it as a circle which is named as the process of idealization. According Soedjadi (1999/2000) explained that perfect assumption of an object that is not perfect is the process of idealization. While generalizations are of general application of a particular situation. As observations of some of the district 'PepKepahiang papaya fruit which tastes sweet, the general conclusion that the papaya from the district Kepahiang sweet taste.

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The following describes the outdoor learning game 'Fishing Fish' in Figure 1 to instill the concept of 'measurement' in the 4th grade of primary school. Students are grouped into several groups. Each group consisted of 7 people. Each group has a group leader responsible for the group. Rules of the game, each student prepares a fishing pole in the form of a piece of wood and rope yarn. Then equipped with a fish meal made from paper. The length of wood and rope handed to each student. Similarly, the amount of paper as fish food delivered to each student. Students are required to measure the length of each rod and rope. Then the students conduct fishing activities by placing the fish food ingredients into the box hexagon shaped fish that had load of paper. The length of the hexagon is measured by students. Students berusahan put food fish hexagon box contains many fish. Then students calculate many fish are obtained. More and more fish were obtained, the student in question as the winner of the game. Each group discussed the results of the activities of each group.

Finally, the students concluded the concept of measuring the length of which is 1 m = 100 cm. Teachers reinforce students' understanding of the results of such measurements. The student's understanding becomes more meaningful. Because students understand the true meaning of its own measurements for obtaining such activities. Mathematical comprehension ability is an ability to understand (to absorb the meaning) mathematics problems or other problems related to (Suhena, 2009). In addition, the students' knowledge is becoming more widespread. Students acquire more knowledge. As knowledge of wood, rope, paper, a way of communicating (discussion), tolerance, adherence to the rule, and the workings of the group.



Figure 1. The game 'Fishing Fish' (Yogyakarta, 2017)

# **CONCLUSION AND SUGGESTION**

Based on the literature review, primary school students' understanding of the basic concepts of mathematics can be built through outdoor learning. Outdoor learning makes concrete media, games, and the atmosphere of everyday life as a means to understand the



basic concepts of mathematics. The basic concepts of mathematics through mathematics outside the classroom learning more meaningful. In addition, through outdoor learning, the knowledge obtained by the students become more widespread. Students acquire a range of knowledge, in addition to the basic concepts of mathematics.

It is advisable for primary school teachers to use outside classroom learning to improve their students' basic mathematical concepts.

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