Contextual-based Science Outdoor Learning to Improve Student Curiosity

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Abstract. Research shows that many scientific learning mostly done in the classroom, while emphasizing in cognitive aspects, results in students less enthusiastic if given scientific problems, thus relying on teachers to answer the questions. Balance between knowledge, skills, and attitude are to be the direction and purpose of learning in accordance with the 2013 Curriculum. To balance those aspects, teachers can use environment around the school or the source of concrete learning, namely outdoor learning. Through Contextual Based Outdoor Science Learning, learning become meaningful because of student actively finds the concept of science that learnt in the context every day. Contextual learning consists of 7 components, namely Constructivism, Inquiry, Questioning, Learning Community, modelling, reflection, and authentic assessment. Those 7 components are related to 4 scientific attitude indicator of curiosity, specifically: enthusiastic in looking for answer, observation through objects, enthusiastic in scientific progress, and questioning every steps of activities and things that haven’t yet known. This research conducted to reveal a relation between contextual based outdoor learning and if that improving the curiosity of students, which benefit to understand that contextual based outdoor learning could improve curiosity, with methods of research consists of literary research.

Keywords: Science; Outdoor learning; Contextual; Curiosity.

1. Introduction

Essence of science are: (a) a body of knowledge; (b) a way of thinking; and (c) a way of investigating [1]. In accordance with as a way of thinking, science is a mental activity to reveal, explain, describe natural phenomena [2]. Explanation and ideas are arranged inside the mind that have a tendency to know (curiosity) to understand symptoms and natural phenomenon, based on observation and prediction, people tends to solve problems. As a knowledge, science is a systemic order of facts, concepts, principals, law, theory, or models that revealed by scientists. Learning process in a learning units held in a interactive, inspiring, fun, and challenging manner, and motivates student to actively participating, and giving sufficient space for initiatives, creativity, and independency in such a way that going along with talent and interests, physical and psychological blooming [3].Those were parallel with mentions that science are related to ways for find out about nature systematic, makes science not only mastering about facts, concepts, or principals, but also a process to discovery [4]. Mastery of concepts in scientific learning will be more meaningful if students finds out the
concepts based on context in everyday living, by themselves. Learning activities that supports students mastering the concepts, by observation in outdoor learning.

In a parallel way with [3] explaining Process Standards that hoping for students to actively participating, science learning process are done with contextual based. Contextual learning utilizing nature and based on nearby environment are done with outdoor learning [5]. Contextual learning is a learning process that connects contextual subjects with everyday living. Through contextual learning, hopefully will be more meaningful because of the characteristic of contextual learning that connects subject and everyday living, then students can actively participating in a learning group to solve problems, observe, research, and conducts conclusion. Students will know about benefits of learning, purpose of learning, how to achieve it, find out whether what student had learned in classroom will gives benefit in future days, and having a knowledge or skill that flexibly can be used in solving problems to problems [6].

Strong connection between scientific method and improvements of scientific understanding, making those two aspects will have a strong influence of student’s attitude towards science. 6 dimensions of scientific attitudes mentioned by are: be rational open to new things, curiosity, not believe in superstitious, objective, and in accordance to assessment [7,8]. Curiosity as an effort to get know, seeing, or gaining experience in a motives to obtain new information. Curiosity is very important for student [9]. Curiosity seen at students doing exploration to answers questions about how and why thing happens, in line with statement of that said people who is very curious will explore the environment around, generalize questions, intention to find out more about how and why in a relationship [10]. Curiosity is an attitude worth to teach at students [11].

Science outdoor learning can facilitate student centered learning that emphasizing on student actively find out about information and learning source. In this article, Contextual based Science outdoor learning will improve the participation of students in the classroom to increase student’s involvement and hoping that students will continue to increase curiosity.

The rest of this paper is organized as follow: Section 2 describes the proposed research method. Section 3 presents the obtained results and following by discussion. Finally Section 4 concludes this work.

2. Research Method
This research used a literature review method. Literature review is an objective research, comprehensive summary and critical analysis of research or non-research that is relevant to a topic being studied [12]. The researcher studied literatures, articles, books, and other sources such as conferences and processes relevant to a particular problem, field of research or theory provides descriptions, summaries and synthesizes data. Usage of contextual approach in learning was affecting the curiosity through available components in contextual learning. In conclusion that science outdoor learning could improve contextual based learning.

3. Result and Discussion
This section presents the results obtained and following by discussion.

3.1 Science Outdoor Learning
Science is a mental activity of scientists who try to reveal, explain, and describe a natural phenomenon or phenomenon. Explanations and ideas are arranged in a mind that is driven by curiosity to understand natural phenomena or phenomena. The basis for solving the problem of knowledge is observation and prediction. As a collection of knowledge, science is a systematic arrangement found by scientists in the form of facts, concepts, principles, laws, theories and models [2].

Natural Sciences (IPA) is a way to find out about nature systematically is not only mastering a set of knowledge but also finding process and knowledge reconstruct through scientific procedures as performed by the scientist. Learning will be meaningful if the investigation activities and experiments involving students actively and directly related to learning resources [13]. The criteria for good IPA
learning not only from books, but teaching should include practice instruments as well as associated with the environment. Therefore, developed IPA learning connecting or brings together the various fields into a single discussion [14]. Every form of learning that takes place outside the room from reading books to natural exploration activities both individuals and groups can be referred to as outdoor learning. Outdoor learning that is often done regularly encourages children to engage in interaction with nature and build them by bringing a number of benefits in everything such as knowledge, skills, social attitudes, respect for nature, teamwork, life skills, eliminating boredom and health and well-being. Outdoor learning is a very suitable tool to provide students with an understanding of nature holistically and the ability to integrate knowledge and skills from various disciplines.

Meaningful learning is encourages students to find out not learning that tells [15]. Meaningful learning in practice will familiarize students to carry out activities doing research, observation, experimentation, observation and conducting information gathering activities from various sources. Outdoor learning involves many senses so that it can provide a memorable experience because students can absorb more material [16]. Outdoor learning can be done through fieldwork. Fieldwork or field work is one form of outdoor learning activities that emphasize students' direct experience on the object being studied. The main purpose of fieldwork is to provide opportunities for students to reach knowledge through experiences they did not get in class [17]. The advantages of fieldwork are: (1) establishing the principles of modern teaching that utilize the real environment in teaching; (2) making the material learned in school more relevant to the reality and needs in the community; (3) more stimulating students' creativity in learning.

Through fieldwork students can observe, experiment, participate in group activities, observe groups of people at work or write reports. Through outdoor learning, students are expected to gain hands-on experience and link material learned with everyday experience.

Outdoor learning is not only done incidentally and always leaves the school environment, but can also be carried out during learning activities at school or during class hours according to a predetermined schedule [18].

3.2 Contextual Teaching Learning

Contextual learning is learning that emphasizes the full process of student involvement to be able to find material that is learned and relate it to real life situations so as to encourage students to be able to apply it in their lives [19]. Contextual Teaching and Learning (CTL) is defined as a way to introduce content using a variety of active learning techniques designed to help students connect what they already know to what they are expected to learn, and to construct new knowledge from the analysis and synthesis of this learning process [20].

Reveals that contextual learning contains the essence of student learning experiences to be able to increase motivation for student interest, learning, and self-confidence [21]. One of the innovative learning approaches, namely the contextual teaching and learning (CTL) approach or also called the contextual approach. The contextual approach has seven main components, namely constructivism, finding (inquiry), asking (questioning), learning community, modelling, reflection (authentic assessment) [4]. Constructivism is the process of building or constructing new knowledge in students' cognitive structures based on experience. According to constructivism, knowledge does come from outside, but is constructed by and from within a person. Knowledge is formed by two important factors, namely objects that are subject to observation and the ability of the subject to interpret the object. Thus knowledge is not static but dynamic, depending on the individual who sees and constructs it. Contextual learning encourages students to construct their knowledge through observation and experience [19].

Inquiry is the learning process based on search and discovery through a systematic process of thinking [19]. Knowledge is not a number of facts resulting from remembering, but results from the process of discovering yourself. So in the planning process, the teacher is not preparing material that
must be memorized, but designing learning that allows students to find their own material material that must be understood. Basically, learning is a mental process that does not occur mechanically. Through this mental process student are expected to develop intact both intellectual, mental, emotional, and personal. The application of this principle in the process of contextual learning begins with students' awareness of the problems they want to solve. Students are encouraged to find problems. If the problem has been understood with clear boundaries, then the student submits a temporary hypothesis or answer according to the formulation of the proposed problem. This hypothesis will lead students to observe in order to collect data. After the data is collected, students are then guided to test the hypothesis as a basis for formulating conclusions. Through a systematic process of thinking, students are expected to have a scientific, rational and logical attitude.

Questioning is seen as a reflection of the curiosity of each individual, while answering questions reflects a person's ability to think. Learning is essentially asking and answering questions. In contextual learning, the teacher provokes students to find their own so the role of asking is very important [19]. Through these questions, the teacher can guide and direct students to find the material they are learning.

Learning Community (Learning Community) recommends that learning outcomes be obtained through collaboration with others. Collaboration can be done in formal study groups or in naturally occurring environments. Learning outcomes can be obtained from sharing with others, between friends, and between groups. In class, learning can be done by applying learning through study groups. Students are divided into groups whose members are heterogeneous, both from the ability and speed of learning, as well as from their talents and interests. Students can learn from each other, who are fast learners are encouraged to help those who are slow to learn, and those who have certain abilities are encouraged to pass on to others [19]. Modelling is a learning process by modelling something as an example that can be replicated by each student. The modelling process is not limited to the teacher, but the teacher can use students who are considered capable. The student can be asked by the teacher to display his skills in front of his friends. In contextual learning, modelling becomes important enough for students to avoid theoretical-abstract learning that allows verbalism [19].

Reflection is the process of deposition of experience that has been learned [19]. Performed by reordering the learning events that have been passed. Through a process of reflection, learning experiences will be included in the cognitive structure of students and become part of their knowledge. In contextual learning, the teacher provides opportunities for students to recall what they have learned. Students are free to interpret their experiences and conclude their learning experiences.

Authentic assessment is a process that is carried out by the teacher to collect information about the development of learning carried out by students. This assessment is needed to find out whether students learn or not, whether student learning experiences have a positive impact on their intellectual and mental development. An authentic assessment is carried out integrated in the learning process. Assessment is carried out continuously as long as learning activities take place. Success in contextual learning is determined by the development of all aspects not only intellectual abilities [19].

3.3 Curiosity

Some attitudes possessed by a scientist means having curiosity, rationality, open-mindedness, critical-mindedness, objectivity, honesty, and humility [20]. Jazuli in [21] states that curiosity is a part of inquiry, investigating or seeking knowledge. Curiosity's attitude provides an advantage in providing motivation to avoid difficult problems caused by discrepancies with external motivation from parents, teachers, groups, and society. Here with the development of this attitude, students are expected to be able to make decisions wisely on a problem [21].

There is a strong relationship between the scientific method and the development of scientific understanding, both aspects will have a strong impact on the attitudes (student attitudes) of students towards science [7]. The attitudes that can be developed include: curiosity, respect for facts, willing to appreciate uncertainty, creative and expert at creating, open thinking, critical reflection, cooperating with others, sensitive to living things and inanimate and persistent objects. There are six dimensions of
scientific attitude such as: rational, open, curiosity, superstitious, objective, and according to judgment [22].

The students and teachers who have curiosity performance, namely: (1) always positive on new, strange, inappropriate, or mysterious things in nature, by trying to find out, explore, and manipulate it; (2) becomes a need or desire to know about himself or his environment or both: (3) observe the surroundings to find new experiences; and (4) always doing exercises and exploration to find out something. A teacher must be able to connect between lessons and events that students see [9].

Indicators of scientific attitudes in curiosity namely; (1) enthusiastically seeking answers; (2) attention to the object being observed, (3) enthusiasm in the science process; (4) asking each step of the activity and things that have not been understood [23].

The learning objective is actually to acquire knowledge in a way that can train students 'intellectual abilities and stimulate curiosity and motivate students' abilities [24].

The dimension of curiosity includes students' feeling of pleasure in the new things found in nature when learning, how clarity students have on a phenomenon, the complexity of students towards the stimulus given by the teacher in the form of problems from a phenomenon, and how awe students the phenomenon is there [25].

3.4 The Relationship between Science Outdoor Learning Based on Contextual with Curiosity

Essentially science is a collection of knowledge, ways of thinking, and ways of investigation related to natural phenomena or phenomena. Explanations and ideas are arranged in a mind that is driven by curiosity to understand natural phenomena or phenomena. In the process of learning science teachers are facilitators, and students as learning centers (student centered learning).

Meaningful learning is learning that encourages students to find out not learning that tells. Meaningful learning in practice will familiarize students to carry out activities doing research, observation, experimentation, observation and conducting information gathering activities from various sources. Outdoor learning involves many senses so that it can provide a memorable experience because students can absorb more material.

Every form of learning that takes place outside the room from reading books to natural exploration activities both individuals and groups can be referred to as outdoor learning. Outdoor learning that is often done regularly encourages children to engage in interaction with nature and build them by bringing a number of benefits in everything such as knowledge, skills, social attitudes, respect for nature, teamwork, life skills, eliminating boredom health and well-being. Outdoor learning is a very suitable tool to provide students with an understanding of nature holistically and the ability to integrate knowledge and skills from various disciplines. Students will feel happier, enthusiastic, and their curiosity increases during outdoor learning. Outdoor learning also presents real and accurate knowledge because it is digested directly by the five senses of students.

Science learning is done contextually so students can actively participate. Contextual learning by utilizing nature and based on the surrounding environment using outdoor learning. Contextual based learning is learning that connects subject matter with the context of students' daily lives. Contextual based learning is expected to be more meaningful because the learning process takes place by connecting subject matter to the context of students' daily lives, students experience themselves, students are active in learning through group learning to solve problems, make observations, practice finding, and draw conclusions. Students know the benefits of learning, learning goals, how to achieve them, knowing that what they are learning is useful in their future lives, and having knowledge or skills that can be flexibly applied from one problem or context to another.

Research has been carried out to evaluate the impact of outdoor learning in improving students' performance in understanding science. Commonly, it is reasoned that outdoor learning is the better platform of active learning that benefits students the most especially in understanding science rather than learning in the indoors [26]. According to [27] being scientific includes being curious, observant, inquisitive on how things occur, and discovering how to find the answers. In the outdoors, sensory learning experiences are readily available that boosts students' level of curiosity and excitement to be
able to be scientific and actively engage in the practices of science [26]. For instance, students have the open access to conduct mini experiments, share ideas with their peers, manage the scientific research process, and use the variables and hypothesis [27].

Contextual learning by utilizing nature and based on the surrounding environment can use outdoor learning methods [7] Contextual based learning is learning that connects subject matter with the context of students’ daily lives. According to [10] through contextual-based learning, learning is expected to be more meaningful because the learning process takes place by connecting subject matter to the context of students’ daily lives, students experience themselves, students are active in learning through group learning to solve problems, observe, practice find, and draw conclusions. Students know the benefits of learning, learning goals, how to achieve them, knowing that what they are learning is useful in their future lives, and having knowledge or skills that can be flexibly applied from one problem or context to another.

4. Conclusion
Knowledge, skills, and attitudes are learning directions and goals in accordance with the 2013 curriculum. To balance these three aspects, the teacher can utilize the environment around the school or concrete learning resources known as outdoor learning. Contextual based learning is learning that connects subject matter with the context of students’ daily lives. So that students can actively participate in learning. Through contextual science-based outdoor learning, students will have active learning activities and increase student curiosity.

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