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Concept Mastery of Ethnoscience-Based Integrated Science and Life Skills Development of Elementary School Students

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Abstract

Observation in SDN Slawi Kulon 03 shows that concept mastery of the elementary students' science is still poor and the life skills that are the basic of the students' character have not been fully explored. Students are also still not familiar with the cultural characteristics of their region. This study aims to see the increase in concept mastery of ethnoscience-based integrated science and the development of elementary students' life skills using guided inquiry learning. This experimental study uses the design of one group pre-test - post test. The sample of the research is the fourth-grade students of SDN Slawi Kulon 03 and SDN Blubuk 06 Tegal. The data collection was using observation technique, written test, and documentation. The results show an increase in concept mastery of ethnoscience-based integrated science and the development of life skills significantly when the teacher used guided inquiry learning in both schools.

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INTRODUCTION

The 21st century is a rapid technological age. The rapid progress of science and technology is like a double-edged knife. On the one hand, it brings positive things but at the same time also brings negative things. With technology, someone can get the latest information and knowledge and find out what happened abroad. But on the other hand foreign cultures that are not by national character come in and influence national culture. Ones should become a capable individual to choose the positive things for their own life.

They are becoming a capable individual starts by learning life skills. Life skills are the ability to deal with problems in life and then try to find solutions to overcome the problems (Supartini, Suharmini, and Purwandari, 2010).

Tajalli, and Zandi (2010) states that social skills are part of life skills to help students face the challenges of their lives since childhood. At least there are five life skills indicators that should be developed in elementary schools, namely: discipline, courtesy, independence, responsibility, and confidence (Mujakir, 2012).

Based on the observation in SDN Slawi Kulon 03, it was obtained that life skills had not been optimally developed. The teacher has not accustomed to students to use life skills in learning activities. Of the five indicators that exist, it is only courtesy and disciplined that has begun to develop and become entrenched. Indicators of independence, responsibility, and confidence still do not appear in students behavior.

Life skills can be trained in all learning including Sciences. At present, elementary school science learning at this time is integrated science learning. Integrated Science Learning (ISL) is an approach to learning that intentionally links several aspects in intra-subjects or between subjects (Novitasari, Masykuri, and Aminah, 2016). By using Integrated Science Learning (ISL), students become easier to master learning material because the learning is distinguished on themes. In ISL, some subjects are taught in the same theme. The theme taught must be appropriate or close to the student's life.

The use of integrated science concepts has been carried out in everyday life whether they are conscious or not. This is because integrated science is very closely related to the surrounding environment (Sayekti, 2012). So, scientific knowledge is obtained through scientific methods and makes students think scientifically. Teachers should be able to associate learning with the environment around students as a source of learning so that learning is more interesting (Rosyidah, Sudarmin, and Siadi, 2013).

Results of Subali, Sopyan, and Ellianawati research (2015) states that learning by using the surrounding environment can make students have better social skills and can foster a sense of love for local or regional culture. Therefore learning by using local culture should have been applied early on from elementary school to foster a love of regional culture. Learning by using local or local culture that is applied to science learning or science is called ethnoscience (Shidiq, 2016). With ethnoscience, students can understand the concept of science as the results of Arfianawati, Sudarmin, and Sumarni research (2016) which show that ethics can improve students' cognitive and critical thinking abilities.

To get the most out of ethnoscience based science learning, the right learning model is needed. One model that can be used is guided inquiry (Ambarsari, Santosa, and Maridi, 2013). Guided inquiry is a way in which students are invited to find something with their efforts (Kuhlthau, 2010). Guided inquiry learning is more suitable for primary school students because due to their character that still needs a lot of help to gain the conceptual understanding. The guided inquiry will also train students' ability to communicate their findings so that this model can help students understand the concept of science. Based on the description above, this study was conducted to determine the increase in concept mastery of ethnoscience-based integrated science and the development of life skills of elementary school students with guided inquiry learning.

METHODS

The type of research is quasi-experimental research. It uses the design of one group pre-test – post-test. The sample in this study were 4th grade students from SDN Slawi Kulon 03 and SDN Blubuk 06, Academic Year 2018/2019 in Slawi District, Tegal. There were 30 students from SDN Slawi Kulon and 36 students from SDN Blubuk 06. There were two variables used in this study. Dependent variables in this study are concept mastery of ethnoscience-based integrated science and student life skills. Independent variable is guided inquiry learning model. Data collection techniques used in this study were test and non-test techniques. The test technique uses pretest and posttest while the non-test uses observation. Pretest and posttest were used to measure mastery of ethnoscience-based integrated science concept, while life skill observation was used to measure the development of life skills. There were 40 questions tested in another school. Based on the validity test, 27 valid questions were obtained. Finally, 25 questions were chosen as pretest and posttest to measure the concept mastery of ethnoscience-based integrated science. Data analysis techniques used was N-gain analysis.

RESULTS AND DISCUSSION

Concept Mastery of Ethnoscience-Based Integrated Science

The increase of ethnoscience-based integrated science concept mastery can be seen from differences in scores before and after the test. The total number of respondents is 66 students consisted of 30 students from SDN Blubuk 06 and 36 students from SDN Slawi Kulon 03. Summary of data before and after treatment are presented in Table 1.

Table 1. Analysis of The Ethnoscience-Based Integrated Science Concept

	Before treatment	After treatment	(g)	Description
Lowest score	28	58	0.55	Medium
Highest score	80	96		
Total	3.716	5.310		
Average	56.30	80.45		

Before guided inquiry applied in the classroom, the teacher usually taught the material from the text book. After the teacher explained the material, he asked the students to answer the questions from the book. When the teacher explained the material, some students did not pay attention to the teacher. Some students chat, joke around, and look sleepy. When the teacher uses guided inquiry, it attracks students' attention. It makes students read the material, discuss the topic, and help each other to find the answer of the questions given.

The ethnoscience concept used in this study is tea processing. The question about ethnoscience is included in the questions of the pretest and posttest to see the mastery of students' science concept. Students had better understand in the material taught because they observe the process of making tea is done themselves. Students can master the material concept taught because they are close to their lives (Taufiq, Dewi, and Widiyatmoko, 2017). Ethnoscience-based science learning that combines learning with the culture will increase students' appreciation of the culture of the community (Atmojo, 2012).

The KKM (lowest achievement score) for science lessons in both schools is 70. This score has been determined at the beginning of the learning year. Table 2 shows the score obtained by students before and after treatment.

Table 2. Percentage of Student Achievement Score Before and After Treatment

	Before treatment	After treatment
KKM (minimal score)	70	70
Students amount	66	66
Average	54.55	80.18
Highest score	80	96
Lowest score	20	58

Before the treatment, there were 12 students who reached the KKM score while the

scores of 54 other students were still below the KKM. Percentage of completeness is 19.70%. The score of students after treatment given increases. Only 8 students scored below the KKM, while 58 other students scored above the KKM. The percentage of completeness is 87.87% after the teacher used guided inquiry model in the learning.

Learning using guided inquiry model starts from the first meeting of the study. The teacher gives questions that provoke students' curiosity. At the first meeting, the teacher discussed the material of natural resources. The teacher encourages students to tell about natural resources in the environment around students. Students discuss in groups about the efforts to preserve natural resources in the environment around them.

At the second meeting, the teacher discussed the ethnoscience in their environment. The teacher explains what has become an icon of their area, which is the tea. At this meeting, students discuss matters relating to tea. The teacher gives teaching materials and worksheets to each group. Students can use teaching materials given by the teacher as a guide to working on the worksheets given by the teacher. At this meeting, students actively discuss with their friends. Students share their understanding of each other to work on the worksheet. Some students ask the teacher to make sure the answers they get. The thing they often ask is an abbreviation of *"wasgitel."* Although they often hear the word *"wasgitel,"* most students still do not know and/or are not right to explain the length of the word *"wasgitel."*

At the third meeting, the teacher invited students to the Poci tea factory to see the tea making process directly. This visit increases students' curiosity and learning interest. Students must work on worksheets that the teacher gives in groups. Students can answer the questions in the worksheets right after getting an explanation from the Paci tea factory officers who have been appointed to assist the students. On this site visit activity, students were given the opportunity to see the steps of the tea process until packaging. During the tour, officers answered the questions asked by students. Student questions are mostly about machines inside the factory. This is very common because large heavy equipment attracts the attention of students who have only once seen large sized tools.

The visit was started by hearing an explanation from the factory officers in the auditorium available in the factory. Using an LCD projector and a sound system made the students more concentrate to hear the explanation given. This is by Wahyudin, Sutikno, and Isa (2016) study which states that the use of multimedia can help improve student understanding. The image presented is more easily accepted by students than just hearing the voice or the explanation of the officer.

Research by Ningsih, Bambang, and Sopyan (2012) states that site visit activities can directly motivate students to find their solutions with various sources that exist and build concept in themselves. Doing site visits will provide activities for students to observe, get information, search for data and find differences in theories or knowledge gained compared to the experiences they encounter in the environment. The activities will increase students' curiosity. Students who have high curiosity will easy to make decisions, develop a spirit to seek answers, approach problems with an open mind, practice problem solving, be objective, honest, thorough, able to work together and enjoy researching (United States Agency for International Development, 2014). Curiosity causes students not only to learn a set of knowledge or concept but to learn the process of their discovery in fostering a scientific attitude (Hendracipta, 2016).

Based on the results of the research it can be concluded that inquiry-based learning has a positive impact on the understanding concept. Şimşek, and Kabapınar (2010) stated that inquiry-based activities increase student motivation because this learning model provides freedom to make choices, provides opportunities to carry out self-regulation and take part in it (Bayram, Oskay, Erdem, Özgür, and Şen, 2013). This is supported by the research results of Prasetyowati, and Suyatno (2016) which show that the results of an analysis in a high score concept mastery test

show that this model is very effective in improving students' mastery of a concept. Likewise, the results of the study by Budiman (2017) show that the increase in concept mastery of each ability group in the inquiry learning model is greater than the increase in mastery in the conventional learning model. Suma (2010) explained that inquiry-based learning effectively improves concept mastery and scientific reasoning. Kurniawan research (2013) found that the implementation of a guided inquiry model in the making biology learning media can improve students' understanding of concept and creativity. Thus it can be concluded that mastery of concept using inquiry learning can help students to have a conceptual understanding, construct meaning and obtain scientific knowledge so that students can master the concept that has been learned.

Life Skills Development

Development of student life skills is measured by observation. In every meeting, classroom observation was conducted to observe students' life skills. The life skills indicators used in this study are discipline, courtesy, independence, responsibility, and confidence. The development of each life skills indicator can be seen in the graph of the development of students' life skills in Figure 1.

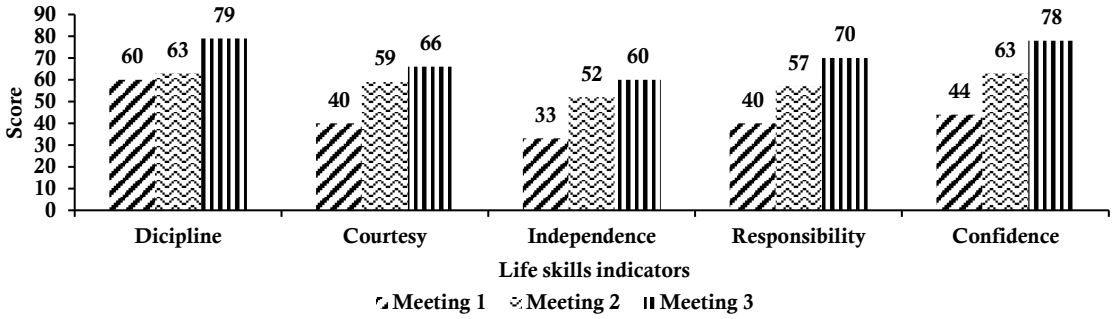

Figure 1. Graph of Students' Life Skills Development

At the first meeting, the score for the discipline indicator was 60 and then increased to 63. At the third meeting, the score increased to 79. On the courtesy indicator, the score achieved in the first meeting was 40, then increased 59. At the third meeting, the score obtained was 66. Independent indicators are the indicator that has the lowest achievement among other indicators. At the first meeting, the score obtained was 33. The second meeting got a score of 52 and at the third meeting got 60. The score achieved for the responsibility indicators was 40 then increased to 57 and at the third meeting became 70. The last indicator, which is trusted yourself gets a score of 44 at the first meeting. This score increased to 63 in the second meeting and became 78 at the third meeting.

The development of students' life skills can also be seen from the increase in the value of (g) at each meeting. The following is an increase in the value of (g) based on meeting 1, meeting 2 and meeting 3.

Table 3. Increasing of (g)

	(g)	%
Meeting 1 and 2 (g_1)	0.27	35
Meeting 2 and 3 (g_2)	0.29	20

From Table 3 above, the value of (g_1) is 0.27. This value is an increase that occurs from meeting 1 and meeting 2, the percentage increase of 35%. The value of (g_2) is the increase in value that occurs from meeting 2 and meeting 3. the value of (g_2) is 0.29. The percentage increase in (g_2) seems to decrease, but it is not true that there is still an increase in each of the life skills indicators studied. It was just that the increase occurs very little or small. This occurs because students are getting used to the methods taught by the teacher in the classroom. There are five life skills indicators observed, namely discipline,

courtesy, independence, responsibility, and confidence.

The first indicator is discipline. Discipline has become entrenched in these two schools. Disciplinary indicators are characterized by the timeliness of class entry and collection of assignments. When the bell rang, students immediately lined up neatly at the door and entered the class in an orderly manner. Only a few students still seemed lazy to enter the class. Students who are late in the class are usually eating or waiting in line to buy food in the front canteen of the school. Increasing the timeliness of collecting assignments given by the teacher is also very good. Most students immediately collect assignments when the time given by the teacher has run out. Discipline enhancement is very visible at the third meeting where students are doing a site visit. Before leaving for a tea factory, students have been given guidance on what to do during the visit, including a worksheet that students must complete. This makes students already understand their obligations during the visit and can do it well. Discipline makes students more focused on learning so that learning outcomes can be maximized (Mahmudah, Rusilowati, and Kartono, 2014).

The next indicator observed is courtesy. The courtesy indicator is characterized by being tolerant of friends in having of differences of opinion, responding well to criticism and input from friends and saying with good ethics. At the first meeting, there were still frequent students who mocked and were angry with their friends. When a student makes a mistake, some of the other students immediately mock and blame with loud intonation. A significant increase in courtesy indicators occurred at the third meeting. During the visit, students seemed happy and joking naturally. Coming to a new environment makes students maintain an attitude and act more politely (Rosnita, 2016).

The next indicator is independence. Students' independence is expressed by trying to solve tasks without the help of others and having initiatives working on their responsibility. At the first meeting, students seemed to do not respect responsibility about doing assignments given by the teacher. At the third meeting, students worked together to solve the worksheets given by the teacher immediately. This has been proven by Aminah, Rusilowati, and Lestari (2014) which states that guided inquiry-based science learning increases the character value of student independence. This increase occurs because the stages in inquiry learning support students to work independently. Students learn to answer questions that arise during the learning process; students learn to use learning resources, students learn without the help of others, students learn to participate actively and take advantage of experiences that have been received.

The next indicator is responsibility. Students obey the rules and orders given by the teacher as well as possible. Students make observations, then discuss with friends to get the best decision. Students carry out their task without asking for help from others. Guided inquiry is learning train students to understand their assignments and try to do them as best they can (Jaya, Sadia, and Arnyana, 2014).

The last indicator observed is confidence. Students can complete the task even though they are realized that they were observed. Confidence makes student learning outcomes increase (Lintang, Masrukan, and Wardani, 2017). Collaboration can be established well if each knows his responsibilities and does his best. Subasree, and Nair (2014) states that cooperation will foster an attitude of empathy towards fellow students, increasing caring behavior towards those who need help and accepting and understanding differences. Collaboration can also help students solve problems and improve social relations well (Pujar, and Patil, 2016). This is also by the results of Veloo, Perumal, and Vikneswary research (2013). The use of guided inquiry learning models in the classroom makes students develop a sense of responsibility, independence, and self-confidence (Supriyatman, and Sukarno, 2014).

CONCLUSION

Guided inquiry learning can improve concept mastery of ethnoscience-based integrated

science and develop students' life skills. The increase of concept mastery of ethnoscience-based integrated science was 42.89% while the increase in students' life skills was 62%. Discipline and confidence develop significantly, while independence is the lowest. Telling the students to read more carefully and giving the students some sources to improve their knowledge is the guiding that the teacher gives to help students overcome the problem during the treatment.

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