The influence of inquiry learning model on additives theme with ethnoscience content to cultural awareness of students

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Abstract. The purpose of this research is to determine the influence of inquiry learning model on additives theme with ethnoscience content to cultural awareness of students and how the students' responses to learning. The method applied in this research is a quasi-experimental with non-equivalent control group design. The sampling technique applied in this research is the technique of random sampling. The samples were eight grade students of one of junior high schools in Semarang. The results of this research were (1) the students' cultural awareness of the experiment class is better than the control class (2) inquiry learning model with ethnoscience content strongly influencing the cultural awareness of students by 78% and (3) students gave positive responses to inquiry learning model with ethnoscience content. The conclusions of this research are inquiry-learning model with ethnoscience content has positive influence on students' cultural awareness.

1. Introduction
Indonesia's national education has the goal of educating the nation and the state. This feeding process begins with learning activities. Learning is a process that occurs because of the interaction between humans and the environment [1]. One of subjects taught in schools is the Natural Sciences. This subject is much related to the investigation in order to construct a logical reason for the cause of a natural phenomenon so we get the concept of science.

Learning is essentially inseparable from cultures around the neighbourhood of students. The culture as a set of beliefs or a general belief that a socially transmitted consisting of symbols, mental, behavioural and various aspects that are formed as a model or benchmark to behave and establish a framework for a particular community [2]. The problem of learning that occurs is that many students cannot apply materials of science taught in schools into daily life. This fact shows that the learning done is less contextual so that the quality of teaching is low.

As for how that can be done to improve, the quality of the learning, process is to use aspects of local culture in learning has been done by previous researchers [3-7]. Natural science teachers support the development of Java-based culture [8]. Cultural content or ethnoscience can be integrated into the learning model chosen by the teacher. One of the learning models suggested by the 2013 curriculum is inquiry. Fundamental inquiry is about asking questions and curiosity as well as with regard to the invention, showing an interest, motivated, found the problem, problem solving, thinking, and create understanding [9]. Inquiry learning model is a model of learning in which all students' abilities to seek and investigate something done in a systematic, critical, logical, and analytical involved to the
maximum in order to obtain a formulation of the invention. The inquiry learning model, precisely guided inquiry, is a model of learning appropriate to build a complete and solid understanding of abstract concepts of the students. Inquiry learning model used in this study is the type of guided inquiry [10].

Character is typical values of good (to know the value of goodness, want to do good, habitable very good, and the impact both on the environment) which is inscribed inside and is reflected in the behavior. Cultural awareness as one of the characters is the ability to choose the culture around him, how does one understand a culture both their own culture and the culture of others, and how one is able to find differences and similarities of culture with other cultures as well as maintain their own culture. Various ethnic groups in Indonesia are scattered in every region raises many cultures living in the community, especially in Central Java.

Concerns about their culture smearing due to a cultural shift towards the West including eating culture eventually arise. A high cultural awareness necessary so that arise tolerance between cultures and the process of enculturation. Culture growing around the neighbourhood researcher gives an idea of how the existing culture can be attributed to science (science) is learnt at school. Local culture and local wisdom can be used as a learning resource for science teachers [11]. Indigenous knowledge society can be transformed into scientific science through ethnoscience. Many scientific knowledge societies can be transformed into scientific science and science is used as a learning resource for [12]. Ethnoscience content is then adjusted to the type of material that will be taught and inserted in the syntax of inquiry-learning model.

The original science of community reconstructed to scientific science in this study is on the theme of additives. Additives theme is selected for some consideration. First, the theme of additives is closely related to food are often encountered every day, so very close to student life. Second, the additives contained in a variety of traditional foods are closely related to the local culture so that it can be inserted ethnoscience content. Third, these themes are not too hard so that the majority of students were more likely to memorize concepts without associated with other concepts. The concept of the additive in the presence of the ethnoscience content, not just memorized, but was associated with concrete examples on traditional foods and original science of community for further transformed into scientific science.

The cultural awareness as a process of self-training of one's own culture and notions of various others cultures as well as be aware of racism [13]. Cultural awareness is a person's ability to look outside them and be aware of cultural values in [14]. This capability is very useful in supporting the education world that is more global due to the development of more advanced time. Thereby causing inter-regional cultural exchanges became easier. Facing the challenge of this culture, it is necessary to attempt to raise awareness of culture so that the younger generation can selectively choose and sort out where appropriate culture with cultural identity. Cultural awareness consists of four indicators according to World Language SAC [15]. To determine the level of awareness of one's culture, namely (1) factual knowledge, (2) intercultural skills, (3) understanding values and perspectives, and (4) personal engagement.

Students' cultural awareness is measured in order to know how far the level in this study, students' cultural awareness is measured using two indicators of cultural awareness, i.e. factual knowledge and intercultural skills for the majority of students only up to the second indicator. The results are then categorized based on the assessment criteria of affective and psychomotor. This article is expected to provide benefits in the increase knowledge about the effect of the use of inquiry learning model on the theme additives with ethnoscience content to cultural awareness of students.

2. Methods
This study is a quasi-experimental research. The design used is Non-equivalent Control Group.
Table 1. Non-equivalent control group design

|     | Exp        | 0₁  | X   | 0₂  |
|-----|------------|-----|-----|-----|
|     | Control    | 0₃  | Y   | 0₄  |

Information:
X = learning inquiry model using ethnoscience content with students worksheet
Y = learning using a direct model of learning with media slideshow
0₁ = pre-test experimental class
0₂ = post-test experimental class
0₃ = pre-test control class
0₄ = post-test control class

The study population is eight grade students from of Junior High School in Semarang, Central Java, Indonesia in the academic year of 2016/2017. The sample is determined by random sampling technique. The samples used are two classes that are in homogeneity. Homogeneity and normality initial data using Final Examination 1’st Semester, where each class consists of 32 students. Grade 8C as the experimental class using inquiry-learning model with ethnoscience content and student worksheet as media assistance. The control class is Grade 8B by using a direct learning model with the help of the media slideshow on Power Point Program.

The independent variable in this research is the implementation of inquiry learning model with ethnoscience content in the experimental class and learning with a direct learning model on theme additive in the control class. The dependent variable in this study is the cultural awareness of students. Control variables in this study included teachers, materials and number of instructional hours.

The data collection method used in this research is the method of observation, questionnaire and documentation. The research instrument used is non-test that includes observation sheet and questionnaire sheet. Observation sheet used to determine students’ cultural awareness after the learning process carried out in the study. The research activities carried out include observation as much as 4 times the observation of control class and experimental class. Questionnaire sheet used to determine the response of students to the application of the inquiry-learning model on theme additives with ethnoscience. Questionnaire sheets were distributed in the experimental class.

Data analysis performed including correlation analysis of inquiry learning model on theme additives with ethnoscience against cultural awareness using Rank Spearman correlation, analysis per indicator of cultural awareness of students, and the descriptive analysis of data questionnaire responses of students to learning.

3. Result and Discussion
The model used in the experimental class is inquiry-learning model, which has five stages in learning activities such as presentation of a problem, verification of data collection, experimental data collection, data organization, and formulation conclusions. Students in the experimental group each learning activity is always given early apperception and connected with the daily life of students in the subject material to be studied. Early apperception aim is to train students view the phenomena experienced so it appears the interest of students to the material to be studied further. Inquiry learning has characteristics of learning in which students construct their own knowledge to a concept of learning materials. Learning is presented by linking the additives material with elements of ethnoscience. These activities help students in the use of indigenous communities around their environment as a source of contextual learning. The students are more interested and enthusiastic about learning because students found ethnoscience approached learning more fun than conventional
Teaching and learning process in the experimental group also accompanied by practical activities. Javanese cultural elements loaded in the learning material on additives theme such as traditional food and cultural heritage of Java that is part of student life. Javanese culture that is loaded in the learning process to help students find out that the concept of science in particular flavourings, sweeteners, colourings and preservatives are applied and utilized in daily life. The gains from incorporating elements of Javanese culture are the student can understand the abstract concept of the additives and recognize the diversity of Javanese culture. Through a learning model-based or integrated ethnoscience can increase students’ cognitive abilities for linking learning in the classroom with the students encounter in daily life [16].

Variable cultural awareness of students in this study was analysed using two indicators factual knowledge and intercultural skills that can be seen in Figure 1 and Figure 2.

The fourth observation on factual knowledge indicator shows that an increase in the experimental class is better than control class. This statement is reinforced by the results of data analysis in which the value of \( r \) obtained are in a very strong category. Results of correlation analysis and t statistic test of inquiry learning model towards cultural awareness can be seen in table 2. The number of students in each experimental class and control class is symbolized by the letter N. Correlation coefficient is calculated to know the value of correlation between cultural awareness with learning material, this coefficient symbolized by letter R. Coefficient determination then calculated to know how big the influence of variable, this coefficient symbolized by letter KD (Based Competence). The information column in the table aims to show whether the level of correlation is very strong, strong, strong enough or not strong.

| Data sources | N | R   | KD (%) | t_{table} | t_{count} | Information |
|--------------|---|-----|--------|-----------|-----------|-------------|
| Experiment   | 32| 0.881| 77.60  | 2.447     | 4.559     | very strong |
| Control      | 32|     |        |           |           |             |

The experimental class at the fourth observation showed a slight increase compared to the third observation. The percentage change of factual knowledge indicator achievement is even a little, but carries the majority of the experimental class students to the very good category. The result of observation of factual knowledge indicator showed increase greater achievement indicators in the
experimental class than the control class. Students of experimental class give more detail in conveying the description of the surrounding cultures compared to control class.

The fourth observation for indicators of intercultural skills in the control class shows the percentage of student achievement increase so that the majority of control students are in good enough category. The fourth observation in the experimental class shows achievement of intercultural skills indicators in the very good category. Experimental class students are able to understand that maintaining their own culture; in this case, the traditional food is essential. These results can be seen from the number of students who prefer traditional foods such as *tahu bakso* and *mendoan* available in the school cafeteria than in the modern food packaging such as sausage.

Experimental class and control class both showed positive changes in implementing the eating culture after getting the material additives. Both samples students become more selective in the foods. The majority of the experimental class students selective in choosing foods based on the composition of additives and traditional elements. Majority students of control class selective in choosing foods only based on the composition of additives.

Cultural awareness as part of life is important to be trained and developed to avoid cultural friction because of the sensitivity of cultural issues. This view is the basis that cultural awareness should be trained as early as possible, especially in schools. Cultural awareness with regard to understanding the cultural influence of the values and human behaviour [17]. The observations results of the student to cultural awareness as a whole show that the experimental class is better than the control class. This fact indicated that the implementation of inquiry learning model with ethnosciense content in the experimental class.

Data from the questionnaire responses of students then summarized and analysed. Aspects assessed on questionnaire sheet are interest in learning, ease of learning materials and content, interest in cultural awareness, student worksheet media and evaluation tool. Assessment of each aspect of the questionnaire can be seen in Table 3.

| No. | Aspect                        | The average percentage per aspect (%) | Category |
|-----|-------------------------------|--------------------------------------|----------|
| 1.  | Interest in learning          | 75                                   | Good     |
| 2.  | Ease of learning material and content | 72                                   | Good     |
| 3.  | The interest in cultural awareness | 74                                   | Good     |
| 4.  | Student worksheet media       | 72                                   | Good     |
| 5.  | Evaluation tool               | 77                                   | Good     |

Based on the data of filling a questionnaire about students' response after receiving the learning process by applying inquiry learning model theme additives with ethnosciense content result in the amount of 16% of the total number of students responded very well, 75% of students responded well, and 9% of the total number of students respond well enough. As for all the indicators are in the good category. These results show that the majority of students are interested in learning using inquiry learning model additive-laden theme ethnosciense.

Students assume the learning model used is quite interesting because the students are actively involved in learning. Students are given the opportunity to construct knowledge of the concepts of what is taught, beginning with learning to formulate problems and create hypotheses. Activities in the form of practical learning by students is very interesting for students to interact directly with a learning object. Ethnosciense content is put into learning can also be said to greatly help students understand the concept because of the proximity of examples of the materials with students' daily lives. The examples used for material additives are traditional foods that are often encountered students.

Learning which contains cultural elements are supported in the curriculum 2013 where culture and local wisdom included in the study [18]. This learning can help students to recall the history of their culture so as to enhance the cultural awareness of students. One example aspect of cultural awareness...
is prefer choosing traditional food than Western food. Observations indicate that after learning students then performed many prefer to consume traditional foods such as *tahu bakso* during recess.

The results showed that the application of the learning model that includes ethnoscience can explore the cultural awareness of students. The study of students' responses also indicate that learning which contains cultural elements able to raise awareness of student culture. Students no longer feel have better cultural background than others who have a different cultural background.

Limitations on inquiry learning model with ethnoscience content based on observations and students’ questionnaire is most students still difficulty in remembering the terms contained in the materials even though the results of the questionnaire responses of students indicate that learning has been well implemented in terms of ease of material. The possibility is that students who have difficulty are students with an interest or type of auditory learning.

Lessons have tended to show motion and visual. This media is suitable for students who have a visual and kinesthetic learning type, while for students with auditory learning type may not be able to follow the teaching well as the type of auditory learning more interested in the learning form of audio. Another limitation is required election proper cultural content and connect with the material being taught because not all cultures can be inserted into a subject matter.

4. Conclusion

The conclusions obtained based on the results of research and data analysis that has been done is the inquiry-learning model on additive theme with ethnoscience content has positive effect on students' cultural awareness of experimental class. This statement is inferred based on the number of students who achieve excellent category on the fourth observation for experimental class more than the control class. Students respond well to the implementation of inquiry learning model with ethnoscience content.

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