Science Learning Improves Students Understanding of Food Ethnobiotchnology in Class III SD Through Making Tempe

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Abstract

Cultural diversity in Indonesia can be used as study material linked to topics that are relevant to scientific knowledge. In a scientific perspective, it is proven by experience, processes, and materials that can be accounted for. In learning science, or what is known as learning science, designing a culture-based learning One of them is linking traditional tempe foods as a part of food biotechnology. Biotechnology is the use of living systems and organisms to make products that are useful and have high nutritional value. Furthermore, namely, tempeh, which is a traditional food made from fermented mushrooms made from soybean raw materials, In strengthening science learning, experiments were carried out as a direct learning method that involved students in the field so as to obtain local cultural values, with the aim that students were able to understand the learning that was carried out directly and have a pleasant experience. This study uses a descriptive research method with a qualitative approach. The findings obtained from this study are that most of the students are able to understand the learning that is carried out through making tempeh. This can be seen from the results of observations, which show that students are very enthusiastic during the learning process and have high enthusiasm. Test results, the results of student reflection journals, and documentation strongly support research. In addition, students also really understand the learning that has been done during the process.

Keywords: traditional culture, biotechnology, tempe, qualitative descriptive.

A. INTRODUCTION

Indonesia is rich in unique cultural heritage. This culture has existed since ancient times and is preserved to this day. Indonesian culture from time to time has always undergone changes, these changes occur because of the social factors that really want change and cultural changes occur very quickly, namely due to the entry of elements of globalization into the culture of Indonesia. Culture can be preserved through the field of education with an alternative approach to linking student learning activities with their cultural background. Involving culture in education is very important to introduce and strengthen it so that it lasts through generations. Cultural diversity in Indonesia can be used as research materials to connect themes relevant to science. According to Arends in (Mayasari, 2017) the ability of teachers to associate the student and cultural world with the school and classroom world is an important component in the handling of cultural diversity. One of the activities carried out is the integration of culture in learning.

Natural Science (IPA) is the science that deals with the symptoms of nature systematically from the results of experiments and observations carried out by humans. In fact, science encompasses scientific knowledge, scientific activities and disciplines. In the

perspective of scientific knowledge is proven by experience, as long as the processes and materials can be held accountable. Then the scientific activity is to dig, search, pursue, or investigate until the knowledge is acquired. Therefore, science in this review is divided into three levels, namely: reading, researching and developing. The latter is the discipline of science in which validity can be scientifically accountable. In this case, the reality concerned is a reality that is based not only on the sensory object, but also on the object of ratio, feeling, as well as spiritual. As it has been revealed that in the learning of IPA primary school students not only study a collection of knowledge that is facts, concepts or principles but study the process of discovery and have a scientific attitude. (Hendracipta, 2016).

In fact, the learning in the field shows that there are still many students who do not understand the material using ethnosains-based learning. IPA learning is still dependent on the teacher, where students are still passive to the learning activities in the classroom directly. The method used when teaching is still using the method of lectures by relying on one source, which is a book so that students quickly feel saturated with the existing learning. The impact of this conventional learning is, among other things, the activity of teachers is more dominant and, on the contrary, students are less active because they are more likely to be listeners. Then the learning done becomes less variable, resulting in less optimal quality of learning in the school. The situation is in line with research conducted by Wenno in (Ikhsan, 2016) which states that there are still many IPA teachers who argue that teaching is an activity to explain and communicate information about concepts. In the concept of learning IPA in SD is the guardian of the class as a teacher who provides learning materials.

This makes teachers have to take steps to strengthen the material in IPA learning by practicing directly so that students can understand the learning material that is specifically related to jumping directly into the learning process. This is directly reinforced by the results of the observations of researchers conducted to SD class 3 teachers that students lack understanding of IPA learning because they use the same method so that the child is still not optimal in learning. The result of student understanding is still not in line with what is expected, this makes learning IPA difficult and boring when it is not to innovate or take new action effectively by jumping directly into the field of learning IPA that is pleasant and at the same time gaining ethnosains value.

For this purpose, the researchers designed a learning process by associating traditional foods with tempe making as one of the alternative learning materials of food biotechnology to improve student understanding and apply existing ethnosains values. Tempe is a traditional food from Indonesia made from fermentation by the fungus Rhizopus sp on soy raw materials. (Suknia & Rahmani, 2020:62). Biotechnology is the use of life systems and organisms to make a product by using living beings to produce a certain product. (Wardani et al., 2017:3). The purpose of this study can be explained through the following research questions:

1. Knowledge of student activity in the learning process with the creation of tempe.
2. Students' understanding of food ethnobiotechnology

In this study is expected to be able to provide increased understanding of students in IPA culture-based learning using tempe.

B. METHODS

The method used in this study is a qualitative descriptive method because this research is a tool for solving problems that are studied by describing a symptom, event, event that occurs by focusing attention on actual problems as they were at the time of the study (Salim & Haidir, 2019, pp. and 49). The approach used in this research is a qualitative approach. According to Steven Dukeshire and Jennifer Thurlow (Sugiyono, 2019, p.2) Qualitative research is research concerning the systematic collection of data and then the results are presented.

The study uses data collection techniques such as observations, tests, student reflection journals and documentation produced based on facts in the field. Data analysis techniques include data reduction, data presentation and conclusion drawing. The research was conducted in SDN Sepatan II Tangerang in Class III. The instrument of this research is the researcher himself.

C. RESULT AND DISCUSSION

The researchers obtained observation data directly in the field. Researchers conducted research on student experiences through the learning process of food technology development by practicing tempe manufacturing at SDN Sepatan II on Monday, March 6, 2023. A total of 30 students are subject to research. Before the experiment begins, the researcher directs what to do at the time the practice makes the tempe.

Earlier, researchers had also prepared a study plan. (RPP). This RPP aims to enable researchers to provide structured learning to students as the learning process takes place. In fact, RPP also aims to design student learning experiences to learning goals. From the learning process in the classroom that the researchers have done, researchers obtain the findings data. Here are the findings data through the observation guidelines of the learning process of food ethnobiotenology on the theme of the development of food production technology through tempe manufacturing.

The results of the observation of student activity in the learning process are as follows.

Aspects observed	Descriptions
Exposing opinions on the concept of food biotechnology asked by the teacher.	All students can express their opinions well as teachers deliver stimulating material on the concept of food biotechnology.
Refer to traditional foods that have ever been known and consumed.	Almost all students know the traditional foods and tempe that are frequently consumed every day.
Learn about food biotechnology.	Students read carefully after being given a sheet of material by the teacher.
Observe the teacher in delivering the material.	All students pay attention to the instructions of the teacher when delivering the material carefully.
Take steps to make tempe through video.	Students who are in class watch video footage given by the teacher in the making of tempe.
Observe the difference between the mushrooms found in the tempe and the remaining rice.	Students who had been divided into groups watched the mushrooms on the tempe and the remaining food rice carefully.
Answer the question about the process of spinning on both.	Almost all students know the process of mixing on both of these products.

Write a reflection journal and read the results in front of the class.	Students write a reflection journal about the learning they have done during this time in making tempe for the first time in their lives.
Make conclusions of learning.	Students respond to the conclusions given by the teacher whatever they learn.

In addition to the observation of its test forms are questions of dual choice related to food ethnobiotechnology in the production of tempe. The researchers conducted the study in Class III with a total of 30 male and female students. Based on data from the test results of 30 students, it was proven that 27 responded correctly according to the material and competence expected. The number of questions of double choice submitted is 10 questions, with the evaluation criteria of each question correctly obtained 1 point, multiplied by the amount of questions. Based on the results of the test, students meet the KKM score above 70, with the highest score of 90 and the lowest of 60.

In the student reflection journal it was found that:

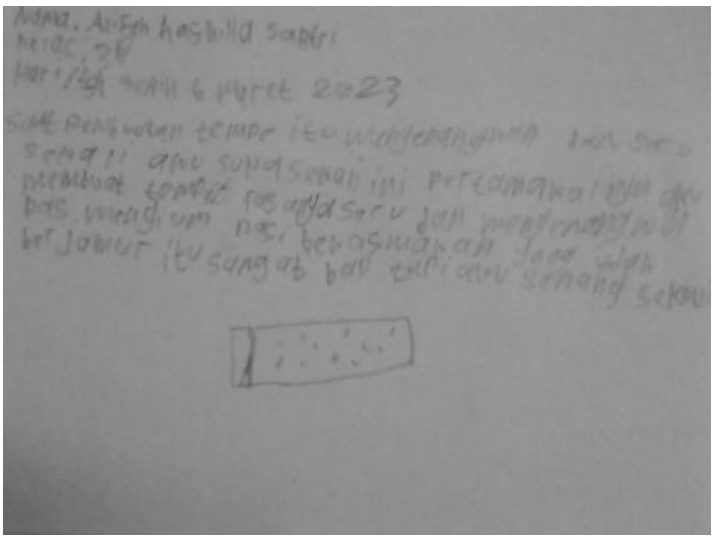

Figure 1. Students' Reflection Journal

AHS said that he had made tempe together with his friends, he was pleased and excited to see the tempe making done while learning because for him this was his first experience. AHS also understands exactly what materials are needed when making a tempe, then how to make a simple tempe that can be done at home with parents. AHS also tells that it is pleasant to smell the smell of the remaining food rice that is reaped by the mushrooms even though it smells stinking and rotten. Then he also described the tempe product that was simple but the interest and curiosity were very high during learning.

From the overall results through observations, tests and student reflection journals that the researchers found, it turned out that almost all new first-time students had experience in making tempe. They only know the tempe that is already made and directly consumed or can be found in the five-legged merchant. Then the child also explored the creation of the tempe that was rebuilt with mushrooms with the leftover rice that had already been grapefruit, the high curiosity and the ability to have the values of ethnosains obtained after learning was completed. As for some children who do not write a student

reflection journal in full but the events that occur in school when the student is asked easily answer that he has a pleasant experience can make the tempe, how the process and what materials are needed. At the end of the learning activity almost all students can describe how the impact and message during the learning process takes place in making the tempe pleasantly.

Picture 4.4 Results of documentation

It is empirical evidence that supports that learning makes the pace by introducing ethnobiotechnology to students provides new knowledge and experience directly. Learning is well accepted because the unconscious child has learned to understand a concept of learning experience after doing practice.

Inside is submitting opinions all students can express well when the teacher delivers the material so that in the driver this material is delivered well and accepted by the student. Then in mentioning traditional food almost all students know that the food we often consume is known and tempe is the typical Indonesian food that we can find. The sheets of material that the teacher has shared are also carefully read by the students by paying attention to the teacher in delivering the material. In the screening of the video, the students attracted attention to the steps of making the tempe to be done. After viewing the video of the students according to the group already shared by the teacher worked on their respective activities, until the final process with the video supplies that have been well sourced. In the process of the occurrence of the mixing on both the products presented in the form of tempe and rice residues almost all the students know it in their simple language that has been observed, but there are also students from some groups argue that making tempe easy to do but must be someone to watch because the stage done not all can be done alone. The other thing is with the growth of mushrooms on the outstanding food residues of rice and the outpouring of an unpleasant smell makes students think that such

outstanding mushroom cannot be consumed. Finally, students wrote a reflection journal with enthusiasm with the learning done today by trying to make the first tempe in their lives, because the tempe they consumed was only the result of not knowing how the process after that students concluded today's learning with enjoy.

Students' understanding of food ethnobiotechnology in making tempe is strengthened by student test results carried out after learning. Test results showed a significant increase. Students answer test questions carefully so that they can be solved well. Competences expected in IPA learning about food ethnobiotechnology by making tempe as an alternative to the learning material include: (1) Students are able to mention and benefit traditional foods that have ever been consumed that are present in the food biotechnological material; (2) Prove the type of mushroom that grows at the tempe and can be consumed; (3) Analyze the factors that influence the growth of the mushrooms on the Tempe and food residues.

From the journal of students' reflection results, showing students' ability to think critically and understand the learning done mostly quite well, but still has not concluded the level of learning done perfectly with writing.

Seeing from the results of the documentation, students showed enthusiasm in the activities carried out for the first time in learning so they participated actively in their group. However, there are some children who have not actively participated in the learning process demonstrated on the relevant student test results. Related students answered the questions given less captured material so they were not able to the expected competence. This does not mean that the student does not have the chance to have a good outcome, but only needs the opportunity to participate more actively by revealing that the relevant student has a privilege in their cognitive development.

D. CONCLUSION

In a broad line of student activity in the learning process that takes place in class III, students are able to express their respective opinions about traditional foods by mentioning the foods that have ever been consumed, as well as paying attention to the process of learning so as to gain direct experience through the tempe making process.

In the process of understanding students about food ethnobiotechnology is seen in the test results that meet KKM values above 70. Then the second view from the reflection journal can be concluded that the child was able to understand the learning of food ethnobiotechnology with the results of direct experiments simply then poured into the student journal. The latter is based on documentation proving that food ethnobiotechnology by making tempe is able to provide new knowledge and experience immediately after conducting experiments.

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