Student Experience about Higher Order Thinking Skill with Contextual Learning based Ethnomathematics using Learning Media and Math Props

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Abstract: This study aims to determine differences in achievement and improvement of the ability of Higher Level Thinking Skills between students who receive contextual learning based on ethnomathematics using learning media and mathematics teaching aids as well as students who only use contextual learning. This study uses a quasi-experiment method. From the results of data processing, the average value of the control class is a class with contextual learning is 75.88889 and the average experimental class is a class with contextual learning containing ethnomathematics is 80.2500 so that the value of sig> 0.05 so that H0 is rejected, the meaning is high-level thinking ability between classes taught using contextual learning with ethnomathematics using learning media and mathematics teaching aids better than classes that only use contextual learning.

Keyword: Learning Media and Math Props, Contextual Learning, Ethnomathematics.

I. INTRODUCTION

The purpose of national education Indonesia contains two important aspects, there are cognitive aspects and affective aspects. The purpose of national education requires that learning must be directed toward developing high-order thinking skills or HOTS [1]. Higher order thinking skills in students is an important task for higher education. Students who are competent analyzers, synthesizers, and evaluators become workers who are better prepared for the work challenges they will face.

Mathematical statistics are compulsory subjects taken by students of mathematics education study programs. From the results of interviews with several students, obtained answers that these courses are less favored by students, the reason is that they must be able to understand and understand the concepts, processes, and apply the understanding they get to the problem of the story. Even though the ability to solve Mathematical problems such as problems with stories in Mathematics requires good skills so that students' abilities become better [2][3] [4][5]. Other than that, from the results of the author's observation that learning that occurs in class is still a lot of memorization. The learning done by the lecturers is not very desirable by students because of the lack of providing an interesting learning experience. Students hope that learning can

motivate learning by connecting learning material to the actual problems that occur in their environment.

So far contextual learning has been applied in learning with contextual aspects in general and has not utilized the wealth of local culture in its learning. Student activity in learning will be very good if learning is also linked to local culture [6] Mathematics in culture is also called ethnomathematics [7], ethno as all the elements that make up a group's cultural identity which includes language, code, values, jargon, beliefs, food and clothing, habits, and physical characteristics. A very important aspect of integrating cultural and folklore elements and values from the daily life and society of the students [8].

The use of learning media and mathematical props will also be very helpful in the effectiveness of learning [3][9]. The media used in the study is internet-based learning, media. Internet-based learning media is a very effective learning media [10][11][12][13][14] because every student can access learning material through his cellular telephone. To strengthen contextual learning, student learning is also assisted by props that are in accordance with learning materials, namely snakes and ladders.

Higher Order Thinking Skills have three levels of revised Bloom Taxonomy, namely levels 4 to 6 which will be broken down into four mathematical abilities namely problem-solving ability, reasoning ability (level 4), critical thinking ability (level) 5), and the ability to think creatively (level 6) [15]. The development of Higher Order Thinking Skills abilities has the following objectives: (1) to regulate knowledge learned into long-term memory, (2) to develop adaptability, (3) to encourage the creation of quality human resources that are able to compete with others. The development of Higher Order Thinking Skills can be done on learning with mathematical statistics because the subject is based on logic and deductive. The development of Higher Order Thinking Skills requires good planning, implementation, and evaluation [16][17][18]. One form of developing Higher Order Thinking Skills abilities is contextual learning. Contextual learning is a system that stimulates the brain to form patterns that embody meaning [19]. Contextual learning is a learning system that matches the brain that produces meaning and connects academic content to the context of students' daily lives [20][21].

Contextual learning is an attempt to make students active in pumping their own abilities without losing in terms of benefits because students also learn concepts while applying and connecting them to the real world [22][23][24][25].

Some key concepts relevant to higher-order thinking skills are based on three assumptions about thinking and learning. First, the level of thinking cannot be related to the level of learning; involves linkages, many components, and levels. Second, whether thinking or not thinking can be learned without subjects based solely on theoretical points. In real life, students will learn content in both communities in school and experience, no matter what the theory concludes, and the concepts and vocabulary they learn in the previous year will help learn high-level thinking skills and new content the following year. Third, high-level thinking involves various thought processes that are applied to complex situations and have several variables.

The problem of this study focuses on determining differences in achievement and increase the ability of Higher Order Thinking Skills between students who receive contextual learning based on ethnomathematics using learning media and mathematics teaching aids and students who only receive contextual learning.

II. METHOD

The study was conducted with a quasi-experiment method. The research design used in this study was The Randomized Control Pretest-Posttest Design Group. The object of this research is the third-semester students, which consists of two classes into the control class and the experimental class. The material in this course is the basic concepts of set theory, probability, random variables, and their distribution, multivariate distribution, special distribution, and deep asymptotic mathematics.

III. RESULT

Based on the data in the field, the value obtained by students in the mathematical statistics course is very low, which is obtained from tests conducted by researchers, 80% of students get a range of C to E. This is due to mathematical statistics are less desirable subjects because students are required to solve story problems that come into contact with things that are encountered every day, bring into the distribution of opportunities and solve them. The lecture process only sits in the classroom and listens to what is conveyed by the lecturer so that the activity of the students is very lacking. If this is left unchecked it will have a negative impact on the students themselves.

The research begins by giving lectures with the same material but with different treatments. in the control class only given contextual learning is different from the experimental class which always applies ethnomathematics in contextual learning and also using math props. Playing some traditional game like snake and ladder game can be attributed to the material in the lecture on mathematical statistics, so it is expected that in addition to students getting to know the play, students will also be able to master mathematical statistics. The material to be used is permutation material and conditional opportunity distribution. It is expected that students can play directly

students can improve problem-solving skills, reasoning abilities (level 4), critical thinking skills (level 5), and creative thinking skills (level 6). Learning media used are internet-based media. each learning material will be presented in Google Classroom to make it easier for students to access anywhere.

Processing results obtained that the sig value > 0.05 so that H0 is rejected, then the average high-level thinking ability between the data from the class taught using ethnomathematics contextual learning is more than the high-level thinking ability between the data from the class taught using contextual learning. From table 1 it is obtained that the average control class (contextual learning) is 75.888889 and the average experimental class (contextual learning with ethnomathematics) is 80.2500. So from these data, it was found that learning achievement by using contextual ethnomathematics learning uses media and mathematics teaching aids better than contextual learning..

Table 1. The Student Score After Posts

Class	The number Student with score > 71	The number of Students	%
Control	14	27	51.85
Experiment	22	28	78.57

After doing posts, from the data above, it is found that score Higher Order Thinking Skills in the experimental class are higher than the control class. Contextual learning with ethnomathematics with media and teaching aids is more effective than contextual learning.

IV. CONCLUSION

This research is very helpful in identifying students Higher Order Thinking Skills associated with ethnomathematics. it can be concluded that the achievement and enhancement of Higher Order Thinking Skills between students who received contextual learning based on ethnomathematics and contextual learning showed significant results with a significance level of 23%. This study has implications for researchers that students' Higher Order Thinking Skills needs to be developed by utilizing appropriate learning methods. Students feel helped by the ethnomathematics learning method because it is an effort to maintain local cultural wisdom.

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