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IMPROVING STUDENTS' SCIENCE PROCESS SKILLS THROUGH IMPLEMENTING AN INTEGRATED LEARNING MODEL WITH LOCAL WISDOM

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ABSTRACT

This research aims to determine the effectiveness of the integrated learning model of local wisdom in improving students' science process skills. This research uses a quasi-experimental design with two groups, namely an experimental group that applies an integrated learning model of local wisdom and a control group that applies a direct learning model. Data was collected using a science process skills test. The data obtained were analyzed using descriptive analysis and statistical analysis using MANOVA analysis. The results showed that there was a significant difference between the science process skills of students in the experimental group and the control group. This shows that the integrated learning model of local wisdom is effective in improving students' science process skills because there is a significant difference with an F value of 1.114.

Keywords: Science Process Skills, Local Wisdom, Integrated Learning Model

INTRODUCTION

Science learning in schools currently still tends to be teacher-centered, where teachers play a dominant role in conveying science material and concepts. This causes low student involvement and activeness in the learning process. As a result, students' science process skills and scientific literacy are still not optimal (Mardhiyah, Aldriani, Citta, & Zulfikar, 2021; Nurjanah & Mukarromah, 2021).

To face the challenges of the 21st century, students need to be able to solve problems and have skills. Therefore, skills are important things that every student must have, the skills that every student must have are science process skills (Salsabilla Setiaji, 2023). Science process skills are one of the important abilities that students must have in learning science. These skills can help students to understand science concepts better and apply them in everyday life.

So far, science learning tends to emphasize remembering and understanding aspects, while students' discussion skills are less well-honed (Fitriana et al., 2019). This situation is exacerbated by the dominant teaching method in the form of lectures, so that student activities during the learning process are very limited.

Science process skills are an important basis (Faridah et al., 2017). These science process skills are divided into three categories: basic, complex, and technical. Basic skills include activities such as observing, asking, classifying, measuring, graphing, calibrating, interpreting data, inferring, predicting (including extrapolation), using numbers, and drawing conclusions. Complex skills include the ability to create hypotheses, design experiments, control variables, and define concepts operationally. Meanwhile, technical skills include expertise in

operating materials and equipment (Okereke, 2019; Jhonson & Jhonson, 2014).

Based on the results of observations, it shows that science learning in schools focuses more on modern or current science concepts. Teaching tends to emphasize theories that are complex and difficult for students to understand. This condition is exacerbated by the lack of concrete examples that can help students understand science theories or concepts taught by teachers. As a result, students think that science is a science that is difficult to understand and abstract, so their motivation to learn science becomes low. In fact, science is actually a simple science and can be explained and proven through various things in the surrounding environment (Ilhami, Riandi, and Sriyati, 2018).

One strategy that can be used to improve students' science process skills is to apply an integrated learning model of local wisdom. Local wisdom is the knowledge and values possessed by local communities that have been tested by time and proven to be effective in solving various problems.

The importance of local wisdom must also be considered as part of efforts to support an increasingly naturalized environment. We must consider the importance of local wisdom as one way to support environmental conservation efforts which are naturally decreasing (Jenkins, 2018). Therefore, schools need education that is based on local culture, and wise teachers must be able to incorporate local cultural values into the science and non-science learning process, but in practice science education in schools pays little attention to the local culture around the place. only the students remain (Husin & Billik, 2018). Local wisdom is the noble values possessed by a community, which can be a source of inspiration and solutions in solving the problems they face. The use of local wisdom in science learning can help link students' knowledge with their everyday experiences. Unfortunately, local wisdom in Indonesia, including in East Nusa Tenggara, especially in South Central Timor Regency (TTS), has not been integrated much into classroom learning, especially in science lessons (Aswita, Suryadarma, and Suyanto, 2018; Ilhami, Riandi, and Sriyati, 2018; Ramdiah et al., 2020).

One learning model that can be applied to overcome this problem is the Problem Based Learning (PBL) model. PBL is a student-centered learning model, where students are faced with authentic problems and asked to solve them through investigation and collaboration. However, the pure implementation of the PBL model is still not enough to accommodate aspects of local wisdom which are important for improving the contextuality of science learning (Savery, 2006).

Therefore, a learning model that is integrated with local wisdom is needed. It is hoped that the integration of local wisdom in the learning model can improve the contextuality of science learning, so that it can improve students' science process skills and scientific literacy. This research aims to determine the effectiveness of the integrated learning model of local wisdom in improving students' science process skills.

METHOD

This research is a quasi-experimental research (quasi experiment). According to Sugiyono (2021), quasi-experimental (quasi-experimental) is a type of research that has a control group, but cannot function fully to control external variables that influence the research results. The research design used was a non-equivalent posttest only control group design. The population in this study used all class VII at Liman State Middle School for the 2022/2023 academic year, totaling 8 classes, with a total of 304 students

distributed in academically homogeneous classes. Before being used as a class research sample, its equality must first be tested to find out that the class used as a sample is a group of students who have equal abilities between one class and another. Equality test using SPSS 16.0 for Windows. Samples were taken using simple random sampling, that is, the selection of samples from the population was carried out randomly without paying attention to the strata in the population. The classes used as samples in this research were classes VIIA and VIIB. Data regarding science process skills was collected using a science process skills test. In making the instrument in this research, the instrument grid was first drawn up. The scientific process skills instrument grid indicators are taken from Nurohman (2010). The results of this research were analyzed using descriptive analysis, prerequisite testing and hypothesis testing. Hypothesis testing uses the MANOVA test.

RESULTS AND DISCUSSION

The object of this research is science process skills as a result of implementing an integrated learning model of local wisdom and direct teaching models. There are two important things compared in this research, namely as follows. 1) application of the guided inquiry learning model to students' science process skills and character; 2) application of the guided inquiry learning model to science process skills. Based on the results of descriptive analysis of students' science process skills taught using the guided inquiry learning model, the average score was 82.45 with a maximum score of 95 while the minimum score was 65. Meanwhile, for classes taught using the direct teaching model, the average score was 75.00. with a maximum score of 90 and a minimum score of 50. General description of the science process skills data that studied with the local wisdom integrated learning model and direct teaching model, it can be indicated that descriptively the average score of the group taught with the local wisdom integrated learning model was higher compared to with a group that is taught using a direct teaching model on Sound material containing local wisdom. The average value of the control class with the direct learning model is 3.08. The results of the average calculation show that the average value of the experimental class is greater than the control. The character scores of students who were taught using the local wisdom integrated learning model and the direct sound learning model containing local wisdom, the highest and lowest scores obtained by experimental class students with the local wisdom integrated learning model were 5 and 4.70 respectively. In classes taught using the direct learning model, the highest and lowest scores are 4.00 and 2.00 respectively. The results of this research are not only guided by the average score of science process skills, but are also guided by the average score of each indicator. The following are the results of the description of mastery of each indicator shown in the table below.

Table. 1 Achievement Results for each Indicator of Science Process Skills during treatment

Indicator	MKL	Category	MPL	Category
Observation	80	Tall	65	Enough
asking question	70	Tall	73	Tall
make a hypothesis	65	Enough	69	Enough
design the experiment	69	Enough	63	Enough
predict	71	Tall	50	Low
communicate	72	Tall	50	Low

Based Based on the data in Table 1, it can be explained that in the integrated learning model local wisdom achieved the average score for each indicator of science

process skills. Each indicator component in the local wisdom integrated learning model group has high and medium qualifications. The direct teaching model group shows that only one indicator has high qualifications and three indicators are in the sufficient category and two indicators are in the low category. The data above shows that overall each indicator of mastery of science process skills in the integrated local wisdom learning model is better than the direct teaching model.

Analysis prerequisite tests include data normality tests, variance homogeneity tests and collinearity tests between dependent variables. The prerequisite test is carried out to determine the distribution of research data for which the hypothesis will be tested and to determine whether there is collinearity. Prerequisite tests were carried out using SPSS 16.00 for Windows. The data obtained becomes a reference for hypothesis testing analysis using multivariate analysis (MANOVA). The normality test was carried out using the Kolmogorov-Smirnov statistical test and the Shapiro-Wilk test. The criteria for testing carried out are data that has a normal distribution if the significance value is greater than 0.05 and if it is smaller than 0.05 or in other cases the data is not normally distributed. based on the Kolmogorov-Smirnov and Shapiro-Wilk statistical tests, it has a significance level greater than 0.05, so it can be said that the data distribution can be said to be normally distributed. This means that the data on students' science process skills is normally distributed at a significance level of 0.05.

Test the homogeneity of groups taught with an integrated learning model of local wisdom and groups taught with a direct teaching model using Levene's Test of Equality of Error Variance. If the resulting significance number is greater than 0.05, then the variance is homogeneous. The results of the homogeneity test for students' science process skills in the local wisdom integrated learning model and direct teaching model groups showed a significance figure greater than 0.05. Because the significance level is above 0.05, in other words the variance between the two groups of learning models can be said to be homogeneous. The homogeneity test of the covariance matrix was carried out using the Box's M test. The covariance matrix between the dependent variables is said to be homogeneous if it has a significance value of 0.05. The significance value in the Box's M test shows a value of 0.871, thus the significance value is higher than 0.05. This states that the variance matrix between students' science process skill variables can be said to be homogeneous. The collinearity test aims to determine whether there is a significant correlation between variables. The collinearity test can be tested using product moment with the help of SPSS 16.00 for Windows.

The hypothesis proposed in this research is that there are differences in students' science process skills between groups of students who study with an integrated learning model of local wisdom and a direct teaching model. Based on the test results, it is known that the significance level for Pillai's Trace, Wilks' Lamda, Hotelling's Trace, Roy's Largest Root is F = 1.114 with a significance level of 0.000 which means $p<0.05$, thus it can be said that there are differences in science

process skills between groups of students. learn with an integrated learning model of local wisdom and direct learning model. So, with a significance level of $p<0.05$, it is said that H0 is rejected. So it can be concluded that there are differences in science process skills between students who study with the integrated learning model of local wisdom and the direct learning model.

CONCLUSION

There is a difference in science process skills between the local wisdom integrated learning model group and the direct learning model with an F value of 1.114 with a significance level of 0.000 which means $p<0.05$. So it can be said that the science process skills of students in the local wisdom integrated learning model group and the direct learning model group are significantly different.

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