THE EFFECT OF CONTEXTUAL LEARNING MODEL ON FOURTH GRADE STUDENTS' LEARNING ACHIEVEMENT AND SCIENCE PROCESS SKILL AT *GUGUS IV* BATURITI TABANAN

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ABSTRACT

The purpose of this study is to describe the difference between science process skill and science learning achievement between the students joining the contextual teaching and learning model and the students joining conventional learning model of the students of Elementary School. This research used the Posttest-only Control Group Design. The population of this study was the fourth grade students of Elementary School Cluster IV Baturiti. The sample of 91 students was taken by using random sampling technique. There were two kinds of instruments namely observation sheet and achievement test. The data obtained were analyzed using Manova. The result of this research indicates: First, the process skill of students joining the contextual teaching and learning model is better than those joining conventional learning model. Second, the learning achievement of students joining a contextual teaching and learning model is better than those joining a conventional learning model. Third, there is the influence of the implementation of contextual teaching and learning model on process skill and students' learning achievement simultaneously.

Keywords: *Contextual, Process Skill, Learning Achievement*

INTRODUCTION

The 21st century is indicated by the rapid development of science and technology in various field of peope's life, particularly on information and communication technology. Therefore, a learning method that manages to prepare students for being literate in science and technology; thinking logically, critically, creatively; and reasoning appropriatey is required. In real life, only few students like to study science due to its difficulty, their lack of ability, or they are not interested in becoming scientists or technology experts.

Students' low achievement or learning outcomes on science are associated with teachers who are considered to be less friendly and pay less attention to their abilities. Teachers only concern on achieving the target of curriculum without considering cognitive, affective and psychomotor aspects; in addition, they do not use appropriate learning methods (Prasasti, 2018). If this condition is left unchecked, students will experience slow progress in mastering the learning materials which results in poor learning outcomes and causing difficulties for them to pursue higher education (Agustina, 2022). Instead of teaching science scientifically, teachers are noticed to teach science within a learning pattern that tends to be mechanistic and lead the students on memorizing (Blanchard, 2001; Ministry of National Education, 2002). Science learning is still indicated by the transfer of science as a product (facts, laws and theories) that must be memorized so that aspects of science as a process and attitude are completely neglected (Istyadji, 2007: 2).

Such empirical findings are clearly providing general indication that science learning tends to be a conventional regularity activity. This conventional learning act is strongly suspected as a barrier in acquiring concepts, comprehension on the concepts, and adequate learning outcomes.

Considering such condition, a transformation in science learning is required to provide students with more effective learning. One of which is by applying a contextual learning model. The contextual learning model is grounded on constructivism theory, which derrives from inquiry activities in learning. It emphasizes on a continuous active process in which students have a responsibility for their own learning process, not their teachers.

Science learning with a contextual approach encourages teachers to choose and design learning environments that allow them to link various forms of social, cultural, physical and psychological experiences in enhancing students' active participation as well as their learning achievement. Instead of being passive observers, the application of contextual approach will create a classroom consisting of active students who are responsible for their learning.

The contextual learning model is a learning concept grounded on an inquiry process that enables teachers to link the lesson to students' real-life situations. It allows students to make connections between their prior knowledge and its application in their lives as members of their families and communities. The link between concepts or subject matter will be experienced as the context in which the concept is used. The learning process will take place in a meaningful way. The learning process will take place naturally in form of doing activities. Thus, it increases students' science learning achievement and their process skills.

Science process skills in learning which include (observing, determining variables, making hypotheses, measuring and analyzing data, drawing conclusions and making reports on practicum results) will be accessible by applying contextual learning models. By carrying out activities that are reflected in the contextual learning component, teachers can carry out authentic assessments towards the students during the learning process. The activities carried out by them will be able to provide optimal achievement of process skills.

In constructivism learning, students are freed to construct their own understanding on the material they are learning. It makes them happier and enjoy the process. In this kind of learning, teachers serve the role as a facilitator to develop students' abilities, e.g. cognitive abilities (Naufal, 2021). The previous cognitive structure possessed by students affects the success of students' learning.

Based on the elaboration above, this study aims at describing the differences of students' science learning outcomes and science process skills, both partially and simultaneously, between students who were taught by using contextual models and those who were taught by using conventional learning models.

1. RESEARCH METODOLOGY

This research is a quasi-experimental with posttest only control group design. The population of this study were all fourth grade students at Gugus IV Baturiti at the academic year 2022/2023, which consisted of six elementary schools. Random sampling was conducted to obtain the samples.

The data on science process skills were obtained by using a science process skills test. The test was in form of an essay consisting of 18 items covering 9 types of process skills and completed with an assessment rubric. Meanwhile, a learning achivement test in form of multiple-choice items was used to obtain data on students' science learning achievement.

There were three hypotheses tested in this study: (1) There were significant differences in science process skills between groups of fourth grade students who were taught by using contextual learning model and those who were taught by using conventional learning model at Gugus IV Baturiti; (2) There were significant

differences in science learning achievement between groups of fourth grade students who were taught by using contextual learning model and those who were taught by using conventional learning model at Gugus IV Baturiti; and (3) There were significant differences in science process skills and in science learning achievement between groups of fourth grade students who were taught by using contextual learning model and those who were taught by using conventional learning model at Gugus IV Baturiti.

Multivariate Analysis of Variance (MANOVA) with a significance level of 5% was used to test the three hypotheses above.

2. RESULTS AND DISCUSSION

The results of data recapitulation after conducting the experiment were shown in Table 1.

Table 1. Rekapitulasi Data

	Experiment Group		Control Group	
	Process Skill (Y1)	Learning Achievement (Y2)	Process Skill (Y1)	Learning Achievement (Y2)
N	47	47	44	44
Mean	66,87	29,49	61,18	25.48
Median	67,00	30,00	60,50	25.00
Modus	62	28	55	24
Std. Deviasi	7,82	2,99	7,37	3.50
Variance	61,07	8,95	54,34	12.26
Range	32	11	28	12
Minimum	52	24	50	20
Maximum	84	35	78	32
Sum	3143	1386	2692	1121

The obtained data were then taken into the test on data analysis requirements as follows.

First, Chi-Square test at a significance level of $\alpha = 0.05$ was conducted to test the normality of data distribution. From the calculations, it was obtained that $\chi^2_{expected}$ for the score of students' process skills on the experimental group was 7.74. The value of $\chi^2_{observed}$ for degrees of freedom = 7-2 = 5 with a significance level of 5% was 9.49. Since $\chi^2_{expected} < \chi^2_{observed}$, the data of process skill score on the experimental group was normally distributed. The value of $\chi^2_{expected}$ for the score of students' process skills on the control group was 4.06. The value of $\chi^2_{observed}$ for degrees of freedom = 6-2 = 4 with a significance level of 5% was 7.82. Since $\chi^2_{expected} < \chi^2_{observed}$, the data of process skill score on the control group was normally distributed. Meanwhile, the obtained value of $\chi^2_{expected}$ for the science

learning achivement on the experimental group was 4.44 and 5.73 for the control group. The two values of $\chi^2_{expected} < \chi^2_{observed} = 9.49$, thus the data on the score of science learning achievement for both groups were normally distributed.

Second, the data homogeneity test conducted with SPSS was shown as in Table 2.

Tabel 2. Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Process Skills	0,464	1	89	0,498
Science Learning Achievement	1,544	1	89	0,217

Based on the results of Lavene's test, it was obtained the value of F = 0.498 with a significance of 0.498 for process skills (Y1) and 1.544 with a significance of 0.217 for science learning achievement (Y2). As the significance level was set at 0.05, both process skills (Y1) and science learning achievement (Y2) were not significant due to the fact that the significance for both of them was greater than 0.05. It indicated that both process skills data (Y1) and science learning achievement (Y2) had a homogeneous variant.

Third, the variance/covariance homogeneity test was carried out with the assistance of SPSS as it could be seen in Table 03. It was noticed that the value of Box' M = 3.544 with a significance of 0.326. As the significance level was set at 0.05, the obtained value of Box'M was not significant. The variance/covariance matrix of the dependent variable was considered equal. Thus, MANOVA analysis could be proceeded.

Table 3. The Result of Box's Test

Box's M	3.544
F	1.152
df1	3
df2	1.663E6
Sig.	.326

After testing the requirements for data analysis, the hypothesis testing was conducted by using MANOVA with the assistance of SPSS. The first and second hypotheses testing used the results on the Test of Between-Subjects Effects as shown in Table 04 below.

Table 4. Tests of Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	f	Mean Square	F	Sig.
Corrected Model	Science Learning Achievement	381.489[a]		381.489	36.647	.000

	Process Skills	780.573[b]		780.573	13.292	.000
Intercept	Science Learning Achievement	68873.358		68873.358	6.616E3	.000
	Process Skills	373637.364		373637.364	6.363E3	.000
X	Science Learning Achievement	381.489		381.489	36.647	.000
	Process Skills	780.573		780.573	13.292	.000
Total	Science Learning Achievement	70595.000	1			
	Process Skills	381179.000	1			

The table above showed that the relationship between learning models and process skills had an F value of 13.192 with a significance of 0.000. Thus, the null hypothesis stating that there was no difference in process skills caused by differences in learning models was rejected. It meant that there were differences in process skills (Y1) caused by differences in learning models. Students who were taught by using contextual learning models had better process skills than those who were taught by using conventional learning models.

On the other hand, the relationship between the learning model and science learning achievement (Y2) had a value of 36.647 with a significance of 0.000. Thus, the null hypothesis stating that there were differences in science learning achievement resulting from the learning model was rejected. It meant that there were differences in science learning achievement caused by the learning model. Students who were taught by using contextual learning models had better science learning achievement than those who were taught by using conventional learning models.

The third hypothesis testing used the results of the Multivariate Tests as shown in the following table.

Table 5. The Results of Multivariat Test

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.989	3.786E3[a]	2.000	88.000	.000
	Wilks' Lambda	.011	3.786E3[a]	2.000	88.000	.000
	Hotelling's Trace	86.057	3.786E3[a]	2.000	88.000	.000

	Roy's Largest Root	86.057	3.786E3[a]	2.000	88.000	.000
X	Pillai's Trace	.295	18.422[a]	2.000	88.000	.000
	Wilks' Lambda	.705	18.422[a]	2.000	88.000	.000
	Hotelling's Trace	.419	18.422[a]	2.000	88.000	.000
	Roy's Largest Root	.419	18.422[a]	2.000	88.000	.000

The results of the analysis showed that the value of F for Pillai's Trace, Wilks' Lambda, Hotteling's Trace, Roy's Largest Root had a significance less than 0.05. This indicated that the F values for Pillai's Trace, Wilks' Lambda, Hotteling's Trace, Roy's Largest Root were all significant. Thus, there were differences in process skills and science learning achievement between students who were taught by using contextual learning models had better science learning achievement than those who were taught by using conventional learning models. It meant that the implementation of learning with contextual models affected students' science learning achievement and the process skills.

The results of the three hypothesis testing above could be elaborated as follows. First, the results of the study showed that fourth grade students at Gugus IV Baturiti who were taught by using contextual learning models had better process skills than those who were taught by using conventional learning models. Contextual learning model was noticed to facilitate students' active involvement during learning activities.The contextual learning model is an alternative for solving problems in the teaching and learning process as well as low students' learning achievement. The contextual learning model is a learning concept grounded on an inquiry process that enables teachers to link the lesson to students' real-life situations. It allows students to make connections between their prior knowledge and its application in their lives as members of their families and communities. The link between concepts or subject matter will be experienced as the context in which the concept is used.

Science learning with a contextual approach encourages teachers to choose and design learning environments that allow them to link various forms of social, cultural, physical and psychological experiences in enhancing students' active participation as well as their learning achievement. Instead of being passive observers, the application of contextual approach will create a classroom consisting of active students who are responsible for their learning. Science education through science process skills not only enables students to be more enthusiastic, interested in science education, but also stimulate them to think critically (Gloriani, 2022).

Science process skills in learning which include (observing, determining variables, making hypotheses, measuring and analyzing data, drawing conclusions and making reports on practicum results) will be accessible by applying contextual learning models. By carrying out activities that are reflected in the contextual learning component, teachers can carry out authentic assessments towards the students during the learning process. The activities carried out by them will be able to provide optimal achievement of process skills.

Second, the results of the study further showed that fourth grade students at Gugus IV Baturiti who were taught by using contextual learning models had better science learning achievement than those who were taught by using conventional learning models. The components of Contextual learning, which include constructivism, questioning, identifying, learning communities, modeling and assessment obviously manage to provide broader insight on science concepts. Constructivists emphasize that it is students who build their own knowledge through inquiry based on their experiences.Therefore, by delivering the questioning component and the learning community, students will be able to find solutions to the problems they are experiencing. In this process, students will be able to construct an understanding of learning concepts. Thus, through the application of a contextual learning model, they will be able to build a better understanding towards the learning concepts.

Based on the perspective of the constructivism, knowledge is built in students' minds through active processes. The constructivism learning model expects students to be mentally active in the formation of knowledge. Students' prior cognitive structure affects the success of students' learning.

Students' ideas towards natural events must be considered in the learning process. One of learning approaches that is relevant with science learning is contextual learning model. Contextual learning allows students to learn about the phenomena that occur in the surrounding environment, and interact with their learning environment in constructing their knowledge.

The objectives of science subjects are achieved by students through various approaches, including contextual approaches in the form of inquiry processes, and learning communities in the learning process. The scientific inquiry process aims to build the ability to think, work and act scientifically and communicate as one of the important aspects of life skills. Therefore science learning emphasizes providing direct learning experiences through the use and development of process skills and scientific attitudes. The formation of students' knowledge can not be separated from the social aspects of students in learning. Students are able to construct their knowledge, more effectively if they are engaged to work collaboratively within a cooperative group in their learning.

Considering that the characteristics of learning science is inseparable from the real world, the application of a contextual approach in learning science will lead the students to have better learning achievement compared to the conventional approaches.

The results of this study are relevant to a previous research conducted by Sopwan in 2022. The results indicated that the Student Worksheet (LKS)-based CTL approach can be used as an alternative to Applied Science learning to improve students' learning achievement. The results of similar research were also shown by a research conducted by Widiyati (2022). It indicated that learning corrective

actions could improve fourth grade students' learning achievement in material on properties of sound through observation methods in science subjects at SDN Selogudig Wetan IV Pajarakan District

Third, the results of this study showed that fourth grade students at Gugus IV Baturiti who were taught by using contextual learning models had better science learning achievement and process skills than those who were taught by using conventional learning models.

One of the learning models that facilitates students' active involvement during learning activities is contextual learning model. The contextual learning model is a learning concept grounded on an inquiry process that enables teachers to link the lesson to students' real-life situations. It allows students to make connections between their prior knowledge and its application in their lives as members of their families and communities. The link between concepts or subject matter will be experienced as the context in which the concept is used.

In order to provide attractive science learning, students are assisted to compare their predicted results with theory through experiments using the scientific method. Science education in schools is expected to be a medium for students to learn about themselves and the natural surrounding. In addition, prospects for further development in its real-life application are based on the scientific method. Science learning emphasizes live experience to develop competencies so that students are able to understand the natural surroundings through the process of "identifying" and "doing". This will allow them to gain a deeper understanding.

Skills of identifying or doing are called inquiry process skills or "inquiry skills" which include observing, measuring, classifying, asking questions, making hypotheses, planning experiments to answer questions, classifying, processing and analyzing data, applying ideas to new situations, using simple tools and communicating information in a variety of ways (through pictures, oral, in writing, etc.)

Science process skills in learning will be accessible by applying contextual learning models. By carrying out activities that are reflected in the contextual learning component, teachers can carry out authentic assessments towards the students during the learning process. The activities carried out by them will be able to provide optimal achievement of process skills.

The components of Contextual learning, which include constructivism, questioning, identifying, learning communities, modeling and assessment obviously manage to provide broader insight on science concepts. In this process, students will be able to construct an understanding of learning concepts. Thus, through the application of a contextual learning model, they will be able to build a better understanding towards the learning concepts. Based on the elaboration above, the implementation of contextual learning models in science learning is able to improve process skills and science learning achievement.

3. CONCLUSION

Based on the elaboration above, it could be concluded that: First, students who were taught by using contextual learning models had better process skills than those who were taught by using conventional learning models. These findings concluded that contextual learning model has a positive effect on students' process skills.

Second, students who were taught by using contextual learning models had better science learning achievement than those who were taught by using conventional learning models. These findings concluded that contextual learning model positively affects students' learning achievement.

Third, the implementation of learning with contextual models affected students' science learning achievement and the process skills. Students who were taught by using contextual learning models had better science learning achievement as well as process skills than those who were taught by using conventional learning models. These findings concluded that contextual learning model positively affects students' learning achievement and their process skills.

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