

# B17 The Students Process Skills in Integrative Thematic Learning

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# The Students Process Skills in Integrative Thematic Learning with Scientific Approach

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**Abstract**—This study aims to determine the influence of scientific approach to students' skills in the integrative thematic learning process of the Fifth Grade in Elementary School Level. There were 3 state elementary schools in UPT Saptosari becoming the subject of research taken through clustering random sampling technique. This is a quantitative study with quasi-experiments, using tests and observation sheets as research instruments. Normality test and homogeneity test were used as pre-requisite tests in this study. The results showed that integrative thematic learning using scientific approach gives positive influence to the students' process skills with 0.00 of the significance level (significance < 0.05). The implication of this study is the students become active in learning as well as students' cognitive learning outcomes become more increased.

**Keywords**—scientific approach, integrative thematic learning, process skills

## I. INTRODUCTION

Basic Education has a very important role in the sustainability and success of education in the next level. It is through basic education that the basic skills of learners are taught and cultivated. Currently, education holds that learners not only as the object of education, but also as the subject of education. The education puts the freedom of the learner in reconstructing his experience as one of the educators. In line with the improvement and adjustment of the national curriculum continues to be developed accordingly with the needs of the times.

One form of curriculum policy changed, in 2013 the government officially announced the implementation of a new curriculum known as the Curriculum of 2013 (*Kurikulum 13*). The curriculum of 2013 was implemented for elementary school, junior high school, up to senior high school or vocational high school. The implementation of the curriculum of 2013 at elementary level uses meaningful learning in accordance with the psychological learners. Primary school age children are in the concrete operational phase, learners begin to think operationally, look at the world objectively, reflective, looking at elements simultaneously and begin to form and use connectedness. Teaching-learning process which relates some concepts in a

single subject matter in accordance with the theme of elementary school age is called as an integrative thematic learning.

Integrative thematic learning is a learning that engages, integrates a variety of learning content into a particular theme. In thematic integrative learning, learners are no longer studying each subject separately, but the learning process is based on the theme and then combined with the other subjects. The integration is done in two ways which are the integration of attitudes, skills and knowledge in the learning process and integration in the meaning of related concepts [1].

Integrative thematic teaching learners allow learners to learn things from multiple disciplines at once. Integrative thematic learning aims to provide meaningful experience to the participants. It is said as meaningful because in integrative thematic learning, learners will understand the concepts they learn through direct observation and connect it with the other concepts that they understand [2].

Integrative thematic learning is compatible with the development of learners that provides learning opportunities tailored to real life and encourages quality learning, i.e. learners are expected to understand and get the concept of knowledge as a whole so that it can solve problems in everyday life. As the opinion expressed by [3] as follows:

By exploring entire topics, instead of just singular subjects, and by relating those topics to the real world, students will have a better learning experience and a deeper knowledge base.

The Curriculum of 2013 implements integrative thematic learning supported by scientific approach. Integrative thematic learning is closely related to the scientific approach. This is supported by [4] that "The use of an integrated curriculum is a powerful way to communicate scientific knowledge." The use of an integrative curriculum is a powerful way of communicating knowledge scientifically.

Learning with scientific approach refers to the emphasis of active learners in the process.

Operationally, the scientific approach to learning emphasizes process skills. With these learning mechanisms, learners will learn to discover that knowledge by themselves. How to learn science by using process skills will bring the learners closer to a more complete learning experience and not get caught in learning memorization.

Process skills are an insight into thinking and reasoning that is much needed in learning. Learning that applies the existence of process skills provides a broad opportunity for learners to do science not just to tell a science. With the process skills, the learner can learn the science according to what the scientist is doing, i.e. doing the observation, classification, application, prediction of interpretations, using tools, conducting experiments, communicating, and asking questions [5].

Based on the preliminary observations (preliminary studies) and interviews in August 2016 and February 2017, learning in some state elementary schools in UPT Saptosari shows that teachers are still the center of learning. Teachers still use the dominant expository model in their learning. This is evident from the learning activities that open the material then teachers are doing a lecture and question and answer with learners related matter, then, at the end of the lesson, students are given assignments based on the existing material. Learners are less enthusiastic in following the learning, it looks there are cool learners talking to their friends. During the learning, students' activeness in asking questions is still not seen. It shows students that are still passive in learning activities.

Based on the results of the interview, the teacher has not implemented a full scientific approach because the most important thing is that the learners are conditioned in the learning process and all the material can be delivered. During the implementation of teacher, learning is also still lack of attention to the skills of the learners process because of the limited time. Furthermore, the nature of learning in which learning involves learners actively, scientific approach needs to be applied in the learning process because it is the spirit of learning based on the curriculum of 2013. The spirit of learning by curriculum of 2013 is the knowledge is obtained from scientific activity. Based on the above description, the researcher wants to know whether the scientific approach has an effect on the process skill on integrative thematic learning of Grade V Elementary School at UPT Saptosari.

## II. LITERATURE REVIEW

### A. Integrative Thematic Learning in Primary School

At primary school level, Curriculum of 2013 uses thematic integrative on learning. Based on Permendikbud RI Number 57 Year 2014 article 11 paragraph 1 mentioned that the implementation of

learning in primary schools or *madrasah ibtidaiyah* done with thematic-integrated thematic approach or integrative thematic. [6] describes integrative thematic lessons using integrated learning principles that use the theme as a unifying learning activity that combines several subjects at once in a one-on-one encounter. Themes are being unified from several interrelated matter scopes. [7] explains that:

This approach is based on the theory that the minds are organized pieces of related information into complex webs, called schemata. New information becomes meaningful when it is integrated into our existing schemas. In this way, knowledge builds on itself, and the schemata grow exponentially. A thematic approach takes advantage of this process by revising around a central theme, thus, enabling students to develop complex webs of interconnected information.

The integrative thematic emphasizes integration of all subjects with a learning experience based on the learners' experience in the real world that will result in higher level learning. As [8] states as follows: Integrated Thematic Instruction-based curriculum stress-based curriculum is a high-order learning tool.

This explains that integrative thematic learning will bring learners to meaningful learning so that learners' learning outcomes are higher.

[9] reinforces the above assertion that in integrative thematic learning and students will study the subjects not separately, but with themes, placed in context and organized logic, as well as related to real life situations. Learners will gain knowledge learned to a r best when in the context of a coherent (intact) and make connections to real world situations.

Integrative thematic learning is a student-centered learning that provides an opportunity for learners to build the concept independently through learning activities designed by teachers. Thematic approach emphasizes more on the involvement of students in the learning process, so that students gain direct experience and find their own concepts that they learn and connect concepts that have been held. Thematic learning places more emphasis on learning by doing something that is in the child's world [10].

Some of the details and explanations of the integrative thematic advantages mentioned above reinforce that integrative thematic learning embodies learning that is student-centered and learning by doing. Integrative thematic learning also helps to provide meaningful learning because it provides contextual learning so that learners are able to develop the ability to think and understand a science for a long time.

Scientific Approach Scientific approach is one of scientific methods which was initially applied to the subjects of science then developed in other subjects as

well as learning with integrative thematic. Scientific method (scientific method) is used to guide students' thinking during a scientific activity that integrates language, literacy, math and science. This is based on the [11] who argue that using the scientific method to guide children's thinking during science activism integrates children's language, literacy, math, and science development.

Learning with a scientific approach designs a learning process so that learners construct concepts, laws or principles actively through stages in a scientific method such as observing (to identify or finding problems), formulating problems, filing or formulating hypotheses, collecting data with various techniques, analyzing data, drawing conclusions, and communicating a given concept. [10]

The learning process by using a scientific approach can be matched by a scientific process, which is intended to provide understanding to learners in knowing, understanding the various materials using scientific approach. The learning process should be implemented and guided by values, principles, or scientific criteria. The scientific criteria include:

- Learning materials based on facts or phenomena that can be explained by certain logic or reasoning; not limited to the imagination, fantasy, legend or fairy tale alone.
- Teacher's explanations, learners' responses, and educational interactions are free from reasoning that diverges from the logical thinking flow.
- Encourage and inspire students to think critically, analytically and appropriately in identifying, understanding, solving problems, and applying the subject matter.
- Encourage and inspire learners to be able to understand, apply, and develop a rational and objective mindset in responding to learning materials.
- Based on empirical concepts, theories, and empirical facts that can be justified. [6]

Based on that, it shows that the 2013 curriculum with a scientific approach implies a scientific approach to learning. Through a scientific approach, learners actively construct concepts, laws or principles through stages in scientific methods in which learners are trained and taught to think analytically rather than just mechanical thinking in the form of listening and memorizing activities only.

Learning with a scientific approach as a learning that communicates knowledge scientifically. Learners are encouraged to play an active role in the learning process. As [12] states that the scientific approach is an approach that in the process of learning students are invited to play an active role in learning.

[13] states that the scientific approach in the learning has steps include examining, ask, try, processing, presenting, concluded, and create. These five activities become the main scenario in the

learning process of Curriculum 2013. These five activities aim to help learners interact directly with something they learn and independently build a concept like a scientist.

*B. Process Skill*

Stages in the scientific approach requires that learners have a process skill. In line with the opinion of [14] who state that process skills describe the kind of thinking and reasoning that is indispensable in learning. Skill is the ability of creativity that uses reason, reason and action effectively and efficiently to achieve the desired result. The process is a skill device that many scientists use in conducting scientific practice. Skills in the classroom learning process is the technique used in obtaining the information learners through their activities.

[15], process skills are divided into basic process skills and integrated process skill more clearly can be seen in the table below.

TABLE I. PROCESS SKILL

Process Skills	Definition
<b>Basic Skills</b>	
<b>Observing</b>	Noting the nature of things and situations using the five senses
<b>Grouping</b>	Associate with objects and events according to their nature (related to grouping places, objects, ideas, or events into categories according to their equations)
<b>Connecting space / time</b>	Describing and manipulating objects and events, related to shape, time, distance, and speed
<b>Using numbers</b>	Linking an atypical quantitative relationship, such as scientific notation, error, important numbers, precision, comparison, and proportion
<b>Measuring</b>	Declaring quantities of objects or materials quantitatively, such as meters, liters, grams, and newtons
<b>Inferencing</b>	Giving an explanation of a particular object or subject
<b>Predicting</b>	Forecasting events that will come dating based on observations that have been done or enough data
<b>Integrated Skills</b>	
<b>Making operational definition</b>	Developing a statement that shows the real description of an object or event by telling what is done or observed
<b>Formulating the model</b>	Creating an image, object or mathematical formula to explain the idea
<b>Controlling variables</b>	Manipulating and control the properties associated with circumstances or events to determine cause and effect
<b>Interpreting data</b>	Making explanations, conclusions, or hypotheses of data created with graphs or tables (often related to concepts such as mean, median, line, frequency distribution, t-test, and chi-square test)
<b>Making a hypothesis</b>	Declaring generalizations or tentative conclusions from observations or inferences that may be used to explain a wide range of occurrences but this is immediately evidenced by one or more experiments
<b>Experimenting</b>	Testing the hypothesis through manipulation and control the independent variables and see the effect on the dependent variable; interpret and show results in report form so others can experiment the same.

Based on the above description, the process skill is a skill for learners in the learning process that demands a scientific activity like a scientist working through a series of scientific activities. The aspects of process skills based on the experts mentioned above there are some skills that can be trained to learners tailored to the stage of cognitive development. For elementary school age according to Piaget theory is in the stage of concrete operational thinking, so basic process skill ( basic process skill) suitable for elementary school children.

III. MATERIAL AND METHODOLOGY

This research type is quantitative research by using quasi-experiment. This study used two different groups: the experimental group and the control group. There are two classes as an experimental group and one class as a control group. In the two classes the experimental group used a scientific approach model in learning as a control group using the expository model in the lesson. The design used in this research is "Pre-test-post-test Control Group Design." The use of this study design aims to examine the differences between those groups.

The population in this study is all students of grade V SD (Elementary Schools) –in the level of UPT Saptosari academic year 2017/2018 consisting of 16 elementary schools. The number of samples in this study consisted of 3 classes from 3 randomly selected schools. This research used cluster random sampling.

The instruments used are tests and observation sheets. The instrument is done in before the learning process (pre-test) and after the treatment (post-test) to know the students' process skills during the learning both in the experimental class and the control class. In this study using participant observation, because researchers directly make observations in the classroom. As for data analysis in this research use descriptive analysis and inferential analysis. Analysis descriptive used to present data that has been obtained from the pretest and post-test in the experimental and control groups. Inferential analysis is used to test the research hypothesis. Independent sample t-test is used in this research which is started by doing analytical pre-requisite test which includes normality and test homogeneity test.

IV. RESULT AND DISCUSSION

Data about the process skills described in this study are pre-test and post-test data and observation data of the process in the form of quantitative data. In summary, the data of students' process skill in experimental group and control are presented in Fig.I.

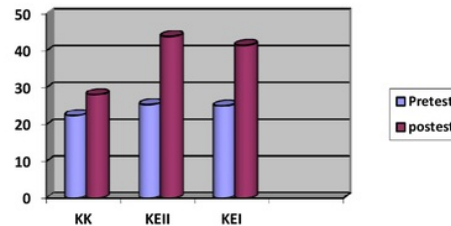


Fig. 1. Means scores of the experimental class and control class

Fig I. shows that there are means increasing for each class both for pre-test and post-test. That results show that the level of students' process skill in experimental class higher than control class.

Data on student process skill of pre test result and post test of each aspect in experiment and control group are presented in table below. Below shows the data .

TABLE II. MEANS SCORES OF THE PRE-TEST AND POST-TEST FOR STUDENTS PROCESS SKILL ASPECTS

Aspects	Means Scores								
	Control group			First Exp. Class			Second Exp. Class		
	Pre test	Post test	Gain	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
Observe	5.79	6.79	1.00	6.21	7.89	1.68	5.46	7.83	2.37
Grouping	4.18	4.43	0.25	4.79	6.50	1.71	4.96	5.33	0.37
Apply	2.18	4.25	2.07	3.04	5.86	2.82	3.17	7.71	4.54
Forecasting	3.54	4.07	0.53	4.04	6.79	2.75	4.04	8.00	3.96
Interpret	3.46	4.43	0.97	3.71	6.79	3.08	4.21	7.63	3.42
communicate	3.32	4.18	0.86	3.29	7.71	4.42	3.58	7.42	3.84

Pre- requisite test before performing hypothesis test is normality and homogeneity tests for pretest, posttest of the students' process skill. Normality test using Kolmogorov-Smirnov test of SPSS software aid . Normality test results are presented p following table.

TABLE III. SUMMARY OF NORMALITY TEST RESULT

Variable	Kolmogrov-Smirnov Significances				
	Experimental Group 1	Experimental Group 2	Control group	α	information
Pre test ofPS	0.209	0.790	0.905	0.05	normal
Post test ofPS	0.159	0.406	0.627	0.05	normal

Based on result of normality test indicate that data of pre-test and post-test of student process skill in experiment class 1, 2, and control have significance bigger than specified alpha value that is 5% (0,05), which means  $H_0$  accepted.

The homogeneity test was conducted to find out whether the data from the population having the same or the same homogeneity of variance. Calculation of homogeneity test was done by using levene test with SPSS program facility. Homogeneity test results are presented in the following table.

TABLE IV. ERROR IN MODALITY

Dependent variable	F	Df1	Df2	Sig	Explanation	
Pre test	PS	0.427	2	77	0.654	homogen
Post test	PS	0.546	2	77	0.582	homogeneous

The significance value of Levene's test results for each bound for the experimental class and control class is greater than 0.05, so it can be concluded that  $H_0$  is accepted which means that the entire subject of the experiment has been homogeneous.

#### Hypothesis testing

Normality and homogeneity tests indicate that the distribution of data obtained on all subjects were normal and homogeneous. Here is a summary table of the results of the analysis of independent sample T-test experimental and control classes.

TABLE V. RESULT OF INDEPENDENT SAMPLE TEST T-TEST OF EXPERIMENT CLASS AND CONTROL CLASS

Class	Variables	$T_{count}$	Df	Sig	Information
EK1 and Control	PS	13.515	54	0,000	There is a difference
EK2 and control	PS	15.407	50	0,000	There is a difference

The table shows that the significance value is  $<0.025$ . Value  $t_{count} > t_{table}$  both in the experimental class 1 and the experiment 2 then  $H_0$  rejected. Thus, it can be concluded that the scientific approach gives a positive and significant influence on the skill of student process in integrative thematic learning of class V SD in Saptosari Region .

Based on hypothesis testing, scientific approach gives positive and significant effect to the skill of the process of V-grade students of SD Negeri in the level of UPT Saptosari. The result of descriptive statistical analysis, improvement of process skill of all aspect as a whole of experiment class 1 and 2 students higher than control class. This can happen because the process skills are trained in a scientific approach. In

summary, scientific approach increases the students' process skill.

Based on the Table 2 scores, the aspect of observing became the higher score in pre-test. It is because the learning process is still using an expository model in which students passively contributed in the learning process (teacher-centered). On the other hand, the post test result, the aspects of communicating and applying on Experiment Class 1 and 2 show the highest increasing because in this integrative learning process by using scientific approach involves active learning process so that the students' process skill increase.

#### V. CONCLUSION

This research indicates that the use of scientific approach model has a positive and significant influence on the students' process skill in integrative thematic teaching in elementary school. Through the application of scientific approach of the students' process skill which previously did not appear not even the attention of the teacher indirectly embedded in every step of learning. The increasing of the students process skill is closely related to the increase of student's learning result, because scientific approach is basically for students to learn by experience and to find out their own knowledge that they want to achieve.

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