

Implementation of Learning Cycle Method Based on Positive Learning Environment as an Effort to Increase Science Literacy of Primary School Students

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ABSTRACT

This study aims to increase the scientific literacy skills of elementary school students through the implementation of a science learning model with a learning cycle method based on a positive learning environment. This type of research uses an experiment with one pretest-posttest group design. The research instrument used observation, scientific literacy competency tests, and student response questionnaires. The conclusions of the results of this study include the implementation of the learning cycle method based on a positive learning environment which can effectively increase students' scientific literacy competencies in the school by designing a learning cycle based on a positive learning environment plan, creating a positive learning environment and encourage a happy learning process. The increase in student learning competence as indicated by an average N-Gain of the experimental group was higher than the control group with an average of 0.39. Apart from competence, an analysis of student responses was also carried out in the learning cycle method based on positive learning environment (SIBELPOLEN) which shows the results that students are enthusiastic, and give a positive response to the method applied

Keywords: *learning cycle, positive learning environment, science literacy*

1. INTRODUCTION

One recent study linked to the success in the learning process is about strengthening Literacy, including the loading of literation science, the ability to use scientific knowledge, to identify questions and draw conclusions based on the evidence, to understand and make decisions regarding nature and changes which is done to nature through human activities. This scientific literacy is considered a key to successful learning at the age of 15 for all students. [1]

One of the goals of studying science contained in the curriculum is that students can understand scientific concepts, explain the relationship between concepts and apply scientific concepts or laws in a flexible, accurate, efficient, disciplined, responsible, polite, caring, and confident manner. in interacting with family, friends, teachers, and neighbors more than that also shows scientific behavior (curiosity; objective; honest; conscientious; careful; diligent; careful; responsible; open; and care for the environment) in daily activities as a form of implementation of attitudes in conducting scientific

inquiry and discussion, Respecting individual and group work in daily activities as a form of implementation of conducting independent and group study of natural phenomena; and using scientific concepts and methods in their lives, so that a person's scientific abilities also contain certain attitudes, such as belief, motivation, self-understanding, and positive values such as religious values, social care, and discipline. [2]

Scientific literacy then has an impact on the aspect of scientific thinking as one of the skills of the scientific process which is the demand of every student at various levels of education, so that they need to have the knowledge, understanding, and *scientific literate* abilities as a basic need. [3]

Thus, ideally in science learning students can learn to observe and analyze their environment, enjoy the beauty and diversity of the environment, and will become aware of the impact of their actions. These are the initial ideas for developing a positive learning environment as well as learning experiences.

The initial idea then became the basis for this research by continuing the observation of science teachers during the teaching and learning process at 2 Madrasah Ibtidaiyah in Cirebon, namely MI PGM and MI An-Nur. The results found that science teachers who were also homeroom teachers used the lecture learning approach, memorizing and dictating students as strategies in teaching and learning activities. There is an interesting fact that the guidebook that is used as a teacher's handbook is the 2013 curriculum teacher book, which according to the author, contains active learning, but its implementation in class is not the case, teachers tend to use worksheets that have a lot of practice questions, so often learning in class only used to answer these questions and tends to hone cognitive alone, without involving other domains.

Researchers see that the teacher's role is still dominant in the classroom and the learning strategies that are carried out tend to be *teacher-oriented*. At the time of observation, it was found that teachers who only focused on the existence of the 2013 curriculum book did not dare to be creative with other active strategies so that the atmosphere of teaching and learning activities became pleasant.

Based on the results of these needs analysis observations, the researchers tried to develop a science learning model with a learning cycle method *based on a positive learning environment* -(SIBELPOLEN) to increase students' scientific literacy, which is in line with the government program, namely the National Literacy Movement (GLN) which has 3 program scopes, namely Movement for Family Literacy, Community Literacy and School Literacy which consists of 6 aspects, namely literacy, numeracy, culture and citizenship, science, finance, and digital. [4]

Research Focus

Based on these considerations, the author formulates several problems that will focus the study on this writing. Research questions include: How to Implement the learning cycle method based on a positive learning environment (SIBELPOLEN) as an Effort to Improve Science Literacy of Elementary School Students in Cirebon City? And the second question about how is the effectiveness of the learning cycle method based on a positive learning environment for Increasing the Science Literacy of Elementary School Students in Cirebon City?

Purpose of the study

In connection with the focus of the study above, the main objective in this study is the realization of the learning cycle method based on *positive learning environment* (SIBELPOLEN) which can improve Science Literacy of Elementary School Students, so that later it can become an alternative to new approaches that researchers present as solutions to the problems faced by science teachers in the classroom. One of the problems faced by teachers in Cirebon City in teaching and learning activities is that there has not been a positive learning environment yet, thus this innovation can create new learning strategies that are relevant to the environment around elementary school students, as in previous research [5]. However, the research in this study is different

from the previous one, namely the modification between the learning cycle and the positive learning environment which aims to increase the scientific literacy of elementary students.

Several theories that support this research, among others, find that scientific literacy is recognized as a need for all students who are not only oriented towards the content of science alone but also in the future of the learners.[6][7]

Selmer's research resulted in a conclusion on how to study IPA for elementary school level in the fundamental problems in science that directly related to the life of students is related to the learning process for the basic science that can be applied in daily life.[8]

In addition to elementary school IPA content, there are Research Turkmen [9] which explains that the learning cycle approach is one of Inquiry-based learning. Learning Cycle – 5E Learning model is a learning model that consists of several phases or stages of activities performed so that students can master the competencies that must be achieved in learning by actively participating.[10][11]

In contrast with the research results, researchers made modifications between learning 5E cycles based on a Positive learning environment framework through stages in LearningCycle-5E including engage, explore, explain, elaborate, and evaluate in the learning cycle [12]. Recent research into the positive learning environment [13][14][15][16] developed a positive learning environment idea to encourage learners to engage actively and engage with the importance of preserving the environment. Also, Krantz explains the student inquiry process that emphasizes the active role of students during learning so that it will make it easier for students to build up their knowledge and related to the phenomena that occur in life. [17].

2. RESEARCH METHOD

This research uses two approaches, the Mix Method between quantitative and qualitative, which is to quantitatively use the experimental research type, with the design used in this research is one group pretest-posttest Design [18] Where in this design students are given preliminary tests and final tests before given treatment. The advantage of this design is that researchers can compare the results of the treatment given. With the initial test scores, researchers can compare the results by observing the final test scores. The class was given special treatment in the learning process, which is with the use of a science study cycle method based on the Positive Learning Environment. This design can be described as follows:

O1 X O2

Description

O1 = initial test scores

X = Treatment

O2 = Final Test value after a given treatment

As for the qualitative approach of using inductive thinking logically. [19] With its data collection techniques in the form of observations, and interviews. As for the technique of data

analysis using qualitative analytical descriptive and also in terms of the perspective is also more qualitative research using emic perspectives that in the collection of data expressed as is, so that the data obtained authors disclosed according to the results obtained in the field without any interpretation in the form of numbers. [20] While checking the validity of the data using Triangulation. [21]

The study was conducted on Grade 5th at Madrasah Ibtidaiyah PGM academic year 2019/2020 a semester on the water cycle material theme environment, by taking one class and divided 2 control groups and experiments. The research instruments used are science literacy and student response polls. The location of the research is done in some Madrasah Ibtidaiyah in Cirebon, but the limitations in this research authors only give 1 location namely MI PGM Cirebon City. Therefore in qualitative research, there is no random sample but rather the sample aims (*purposive sample*). [22]

3. RESULTS AND DISCUSSION

The results of this research are more relevant to novelty authors related to the implementation of the Learning cycle method (learning cycle) based on the Positive Learning Environment (Polen) (SIBELPOLEN) in class, as an effort to improve the science literacy of Students Madrasah Ibtidaiyah. By the way of 1) designing of Sibelpolen-based learning Plans, 2) creating a positive learning environment [23], and 3) encourages a happy learning process [24], it aims to allow elementary school students to understand the basic concepts of science and to internalize the values embodied in the scientific process in the application of daily life with full enthusiasm and happiness. [25]

a. Implementation of the learning cycle method based on positive learning environment (SIBELPOLEN) for improving student science literacy

Thus the next step that the researchers took was the implementation stage of the science learning model with SIBELPOLEN to improve the scientific literacy of grade 5 students at MI PGM, as for the components and their elaboration as follows:

a. Analyze learners

The analysis of students carried out at the beginning aimed to examine the characteristics of students at Madrasah Ibtidaiyah who were treated. These observations include 1) the level of ability and intellectual development, 2) background experience and 3) individual or social skills related to learning topics, the environment, media that can be developed to achieve learning objectives, and by the development of science learning with strategies learning cycle Based on a positive learning environment.

b. Setting learning objectives (State Performance Objectives)

In the early stages of planning, The earliest thing to do is to set learning objectives by setting specific learning standards and objectives. The learning objectives can be obtained in the

2013 curriculum or relevant syllabus. The formulation of learning objectives or indicators of achievement of learning achievement is based on core competencies and basic competencies listed in curriculum 2013 of Grade 5 Science materials at elementary school. Researchers set an indicator of achievement by referring to the three domains of the first, the cognitive realm relates to behaviors that emphasize the intellectual aspects such as: remember, understanding (understand), applying, parsing (analysis), evaluation, and creativity (create). Second, the affective realm contains behaviors that emphasize aspects of feeling (feeling), emotion, interest, attitude, and values, This realm is the realm underlying this research because it relates to positive learning, which of course implicates the aspect of attitude, in the science material based on Sibelpolen is expected learning objectives can stimulate positive feelings such as happy, grateful and caring for the environment. Thirdly, the psychomotor domain about the behavior of physical skills, contain the content of scientific procedures and skills (skills) that can be obtained from experimental or practicum activities.

c. Select Methods and Media

The teaching method used by researchers is a method developed by researchers, which is a positive learning environment based cycle method (SIBELPOLEN) combined with an Active Learning strategy, the objectives of the strategy in line with the Science Literacy strengthening program, but this method is not the only method used, researchers also use collaboration among several methods that correspond to the class conditions. The use of learning media is also very varied, adapting to the context of the materials and facilities found in schools.

d. Assign Learning Materials (Utilize Materials)

The materials provided for Grade 5 students have been researchers integrated and adapted with syllabus and RPP which is contained in one semester so that students can directly learn without having to reconfigure it with research materials and even learners can simultaneously conduct trials with the method developed by researchers. The material that is currently underway is related to the environmental theme and ecosystem theme so that the researcher adjusts this ongoing material with the scenario that will be done, and this is an indicator that the model of the appropriate Sibelpolen and can be used on any material in each sub-theme related to basic competency of science

e. Formulating the right evaluation tools (Evaluation and revision)

An intrusive evaluation or test tool is required some initial steps that are the identification of learning objectives, composing a grid, and determining the form of the test to be used. The tests designed in this study are about science literacy in the form of readings and writing bills. Problem compiled in the form of essays, science literacy material is adjusted to the condition that is up to date this so that students can experience factual learning experiences

The design of learning for learning activities in the class related to the SIBELPOLEN method is as follows:

1. *Early activity:*

For the first time, Class begins with a greeting, asking for news, and checking students' attendance. Then the class continued with a prayer led by one of the students. Students who are asked to read prayers are students of students who today come earliest. (goal: Respecting students' discipline)

Elicit (set goals):

Teachers start with informing the learning objectives today by giving a fun story. (Goal: Create a sense of delight/alpha Zone)

Encourage:

Teachers promote learners in the learning process through an activity of call-to-action reading and writing. Before reading the teacher's book explain the purpose of the activities and invite one of the students to discuss the following questions:

- What's on the book cover.
- What is the book title
- Roughly this tells about what

(goal: Improving child literacy)

Teachers open the lesson by asking students to observe the image of the water cycle through a YouTube video with scene-setting visualization techniques. (goal: Quickly attract students attention)

This exception activity aims to familiarize students with a curiosity about the process of learning, and cultivate skills to understand, discuss, and then analyze the concepts they have observed

2. *Core activity*

Engagement:

Encourage student involvement by asking a few students to briefly explain the water cycle videos submitted before the teacher describes the topic and the teacher emphasizes active student involvement through questions or problems earlier. (The goal is to generate students interest in science lessons)

Students are stimulated with the following questions:

- “ Have you ever noticed how the rain?”
- “ Have you ever observed after flooding, where water will recede?”
- “ Mention some of the water benefits you know”

Teachers use the above referral questions to encourage students to engage by encouraging students to

ask more about learning topics. (Goal: Increase students' curiosity about learning and engagement topics actively)

Before entering the exploration stage, the teacher prepares the musical scene setting in the classroom learning environment, playing accompanying instrumental music during the learning process, the goal to give a positive effect on the child's brain as well as for the right brain balance stimulus & left-hand critical and creative logical functions.

Exploration:

Teachers give 2 origami papers on each student and give the opportunity to draw 2 conditions, first the image in the event of rain or flood and the second image process of the water cycle that has been aired on the previous video, teachers provide pre teach in the form of videos and teachers to invite students to draw inside or outside the classroom, a teacher's task to supervise students' behavior in the activity. (Goal: Pre-teach to provide procedures to be performed when activities outside the class)

Individually, students are required to draw pictures of the water cycle and provide a name label in each of its stages. (goal : For students to think critically and to be creative thinking by creating a picture based on their own student style)

Explanation:

Teachers use pairing techniques by inviting students to exchange information about their images to one partner friend.

Some students are appointed to present back in front of the class drawings that have been created

(goal : Students understanding of important information according to literature and Students skills in presenting and processing the information they find in discussion activities)

Elaboration:

Students are invited to write key points of the material and conclude their impact. Students are invited to identify the activities at home related to water utilization and write them in a piece of paper. (goal : Students understanding of the information that has been obtained in daily life applications and Students skills in concluding and analyzing the information they find in identification activities).

3. *Final Activity*

Evaluation on process:

Teachers assess the effectiveness of phases in core activities and also evaluate the content (scientific knowledge), context (understanding concepts and situations), competencies (scientific process skills) and scientific attitudes of students (responses, interests, support and responsibilities)

Teachers give students the opportunity to complete assignments independently or group
 Students conduct activities in accordance with the teacher's direction but remain free to active in group work
 Teachers give a quick question to repeat again

Enjoyable Reflection:

Teachers help students to make fun reflections and review activities that have been done through the invitation to write fun experiences related to the material,

Individually, students are required to write an experience that is effective for students

Before writing the teacher invites students to close their eyes and exhale regularly accompanied by music followed by writing The learning experience. (Goal: Increased child literacy and the establishment of positive thinking and happy attitudes)

Note: Activity results can be used as data for teachers to view the success of the SIBELPOLEN learning model and should not be entered in student value books

b. Analysis of Student Science literacy Enhancement with Learning cycle method based on Positive Learning Environment (SIBELPOLEN)

The analysis of students' scientific literacy competencies was carried out by the researcher by first giving a test of the ability to answer scientific literacy questions which were designed in the form of descriptions in the form of reading and writing bills. The questions are arranged in the form of an essay. The material for scientific literacy questions is adjusted to the conditions that are currently up to date so that students can experience a factual learning experience. As the data in the following table:

Table 1. Student Science literacy Skills

School	Aspects	Students	Positif	Prosentase	Negatif	Prosentase
	Science Literacy competencies		Able to answer literacy problems		unable to answer literacy problems	
MI PGM	Test of science literacy	20	2	14,3	18	85,7
	rata-rata			14,3		85,7

Based on the data in table 1 as evaluation and science literacy test, obtained by the results of students ' ability of 85.7% have not been able to answer the literacy questions given by researchers. This is due to several factors in the SCIENCE materials, students are not familiar with essay or long narrative form as a feature of science literacy, so that students are confused in solving details and lazy students to read the problem in the form of the story until complete. The table results in the pretes and postes values of the group before

being given treatment (control group) with after being given treatment (experimental group) as follows:

TABLE 2. AVERAGE VALUE OF PRETES AND POSTES

Kelas	No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Rerata
5.2	Pretest	40	57	57	47	52	53	60	55	43	61	68	37	50	61	41	52	64	69	69	52	55
	N-Gain	0,3	0,5	0,4	0,3	0,4	0,4	0,5	0,4	0,3	0,5	0,5	0,3	0,4	0,4	0,4	0,3	0,4	0,5	0,5	0,3	0,39
5.2	Posttest	91	79	97	93	73	46	93	61	65	95	96	75	69	81	87	80	69	81	97	79	81
	N-Gain	0,9	0,7	0,9	0,8	0,6	0,4	0,9	0,5	0,5	0,9	0,8	0,7	0,5	0,7	0,8	0,7	0,6	0,7	0,9	0,7	0,71

Based on the data above, it was found that after being given treatment the experimental group obtained the lowest N-gain, namely 0.4 (medium category) and the highest N-gain was 0.9 (high category), higher than before being given treatment. The results of the pretest and posttest in the experimental group provide evidence that the application of the learning cycle method based on positive learning environment (SIBELPOLEN) can improve the scientific literacy competence of elementary students. The homogeneous average value of students who are able to improve students' scientific literacy through the application of a learning cycle based on positive learning environment (SIBELPOLEN) is generally higher than students who learn using lecture and memorization methods

4. CONCLUSION

The conclusion gained in this study is the improvement of Science literacy competence of elementary school students can be done one of them with the implementation of a learning cycle Method based on positive learning environment (SIBELPOLEN), and based on the research method has fulfilled the criteria of feasible, effective and significant in improving students ' learning competence on science materials through the stage of 8E that has been developed researchers.

The method of Sibelpolen proved to improve the competency of science literacy students demonstrated by the group after given treatment obtained the lowest N-gain is 0.4 (medium category) and the highest N-gain of 0.9 (high category) is higher than before given treatment. The results of pretest and Postest in the experimental group provide evidence that the application of a positive learning environment-based learning (SIBELPOLEN) cycle method can improve science literacy competence of elementary school students, so that the method of Sibelpolen in Science learning is able to improve science literacy skills Grade 5 students elementary schools.

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