THE EFFECTIVENESS OF LEARNING MODEL GAWI MANUNTUNG

by Prodi PGSD

THE EFFECTIVENESS OF LEARNING MODEL GAWI MANUNTUNG TO INCREASE HIGH ORDER THINKING SKILLS AND DIGITAL LITERACY SKILLS ELEMENTARY SCHOOL STUDENTS

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Abstract

High order thinking skills and digital literacy are the important skills on the society 5.0 era. It must develop from elementary school students. Based on the result of Programme for International Student Assessment (PISA), more than 70% Indonesian students unable to answer the high order thinking skills question. The result make Indonesia reach ranked 68 out of 74 countries. Beside that, according to the survey of Indonesian communication and information ministry, digital literacy in Indonesia has not reach yet "good" level. According to observation and interviews with 500 elementary school teachers in South Borneo Indonesia, less than 35% of teachers design learning activity based on high order thinking skills and digital literacy. The solution is the innovative learning model is given the acronym GAWI MANUNTUNG, which stands for Group, Analysis, Work together, Inform, Solve the problem on outdoor, Actualization of the solution, Battle games, Unity on role play, Manage conclusion and Invent the creation. The GAWI MANUNTUNG model was designed based on the culture and the local wisdom of the Banjarmasin people. GAWI MANUNTUNG on Banjarmasin language means work together until we get the best result. This research described the effectiveness of society 5.0 skills using the GAWI MANUNTUNG learning method for fifth-grade students of Public Elementary School.

We use the Research and Development (R&D) mixed with the classroom action research method. The Research and Development uses the 10 stage designed by Borg and Gall (research information, planning, designing the product, preliminary field testing, revision, main field testing, revision, operational field testing, final revision, dissemination) and to explore the effectiveness of learning model GAWI MANUNTUNG, we use quasi-experimental research, One group pretest-posttest design. The subjects include 500 students of fifth grade elementary school from 5 regency in South Kalimantan with the representative 5 school in every regency. Importantly, the research variables high order thinking skills include problem solving (PS), critical thinking (CT), Creative Thinking (CrT), analytical thinking (AT), and logical thinking (LT). And the variable digital literacy include information and data literation (IDL), communication (Cm), Collaboration (Cl) and technology skills (TS). The tests and non-test techniques were used to collect data on students' high order thinking skills and digital literacy which were analysed qualitatively and quantitatively.

The results showed that: 1) validation score of the learning model by 5 experts was get a very good criteria (X= 4.58) (SD = 0.12). It means that the learning model GAWI MANUNTUNG is valid, reliable, and feasible to be implemented on the preliminary, main and operational test. There was an increase in high order thinking skills from the first meeting to the last meeting. The average score in the pre test and post test from cycle 1 and las cycle of High Order Thinking Skills: PS was 1.65 increased to 4.78, CT was 2.57 increased to 4,78, CrT was 1.64 increased to 4.54, AT was 1.57 increased to 4.56, LT was 2.55 increased to 4.55 . The average score in the pre test and post test from cycle 1 and las cycle of digital literacy skills: IDL was 2.65 increased to 4.78, Cm was 2.57 increased to 4.56, Cl was 2.64 increased to 4.61, TS was 1.55 increased to 4.65. This study concludes that the learning model GAWI MANUNTUNG effective to increase high order thinking skills and digital literacy skills.

Keywords: learning model, GAWI MANUNTUNG, high order thinking skills, digital literacy, elementary school.

1 INTRODUCTION

The learning process in the industrial revolution 4.0 era requires learning activities that lead to the development of higher-order thinking skills consisting of critical thinking, problem-solving, creative

thinking, communication, collaboration, analytical thinking, and logical thinking [1]–[3]. The development of these skills requires the cooperation of teachers, principals, and parents. Future human resources will face challenges in developing information and technology literacy skills, critical thinking skills and creative thinking, communication, and collaboration [4]–[9]. On the other hand, the main components in 21st-century learning are skills, knowledge, metacognition, and character. We must be committed to designing learning activities that develop these skills so that learning outcomes are not only oriented towards cognitive skills.

The most important skill developed since elementary school age is critical thinking. If students have this skill, they are able to think deeply and structured and dare to speak the truth and evaluate things from various perspectives. These skills will help a person make the right and best decisions in his life [4]–[10]

Other important skill for the young generation to have is creative thinking. Someone who is creative will be able to innovate through the development of broad ideas and express opinions and new findings to solve problems in social life, have high curiosity to find the truth of an opinion, even make students able to be open and responsive to different perspectives. Creative thinking is characterized by fluency, flexibility, originality [11]–[13].

Skills that support critical and creative thinking are problem-solving. Education today is required to produce elementary school graduates who are able to solve various problems related to everyday life. Problem-solving skills have an impact on students' ability to think deeply and consider various solutions to a problem to produce fast, precise and accurate solutions [14], [15]. In addition, students who are trained to think logically and analytically will have the speed and accuracy in solving problems and get used to arguing or communicating with various points of view according to the context of the problem [4], [9], [13], [16], [17].

In addition to high-order thinking skills in the 4.0 industrial revolution era, it is important for the community to master digital literacy. Technology in the digital era has developed into an all-digital direction. One that is affected by the development of digital technology is digital devices [14], [18], [19]. Digital devices themselves consist of Personal Computers (PC), Smartphones, Laptops/Notebooks/Netbooks, and Tablets. Through digital devices, we can access digital media in the form of websites, social media, digital video, digital audio, and much more [14], [18], [19].

Digital literacy plays a role in facing challenges in every use of information and communication technology. As for the first challenge, digital literacy plays a role in searching, finding, sorting, and understanding the right information among the many emerging information flows, the second challenge, digital literacy plays a role in the individual's ability to be able to distinguish between positive and useful content and negative content [14], [18], [19].

The need for developing learning models to facilitate skills-oriented learning processes in the era of the industrial revolution 4.0 and students' digital literacy is supported by previous research conducted by Agusta & Noorhapizah (2020) that 71.23% of State Elementary School teachers in Banjarmasin City do not know how the concepts and achievement of higher order thinking skills in the form of critical thinking skills, creative, logical and problem solving. Furthermore, the same research also revealed that the learning process carried out in the classroom, namely 82.35% of public elementary school teachers in Banjarmasin City had never packaged learning by integrating critical, creative, logical and problem-solving thinking skills. The cause of the facts that occurred is that one of the teachers was never provided with in-depth knowledge of higher-order thinking skills and there were no teaching materials that lead to higher-order thinking skills that made it easier for teachers to carry out the learning process expected in the era of the industrial revolution 4.0. Furthermore, Agusta & Noorhapizah (2020) states that the learning process in one elementary school in Banjarmasin is still knowledge transfer and has not developed student creativity. The same thing was also stated by Agusta, Suriansyah, Pratiwi, Noorhapizah, & Hussin (2022) that elementary schools in Banjarmasin city still have not developed student independence in learning. A similar condition was also stated by Agusta & Pratiwi (2021) that the learning process at elementary school in Banjarmasin still makes the cognitive domain the main demand.

The results of preliminary observations by researchers on the elementary school teachers starting from December 09 to 28, 2021, found 487 of 600 elementary school teachers in four regency in south kalimantan, consist of Hulu Sungai Selatan, Hulu Sungai Tengah, Hulu Sungai Utara, Tapin and Banjar, still using the lesson plans that were prepared in a simple way without paying attention to the achievement of students' higher-order thinking skills and digital literacy, in both the design of learning activities and evaluation. 405 of the 600 teachers surveyed have never done learning with a variety of learning models and use the technology on learning process. Specifically, researchers conducted interviews about teachers' knowledge of students' high order thinking skills and digital literacy, 415

persons stated that they did not know in detail and had never developed such high order thinking skills on the learning process using learning models that lead to the development of each student's skills. And 398 never develop student's digital literacy skills consist of information and data literation, communication and collaboration, and technology skills.

Based on this background, this study will describe the results of developing a learning model based on local wisdom that has the potential to develop high order thinking skills consist of critical thinking skills, creative thinking, problem-solving, logical thinking, and analytical thinking. And digital literacy consist of information and data literation, communication and collaboration, and technology skills. The learning model developed was named the learning model GAWI MANUNTUNG (Group, Analysis, and observation, Wondering observation result, Intensive data collection, Making experiment on outdoor, Analysis the result, Negotiation of the solution, Using technology, Necessity intelligence development, Task Product Creation, Unity on presentation and role-play, Network Tournament and Games). The urgency of developing this learning model is supported by a similar study which has done by Chaiyama that the 21st-century skills like Critical Thinking and Problem Solving, Creativity and Innovation, Cross-cultural Understanding, Collaboration, Communications, Information, and Media Literacy, Computing and ICT Literacy, Career and Learning self-reliance must develop by the right learning strategy[14]. So, they are developing the learning model by using active learning activities to develop learning skills in the 21st century. In another study which has done by Hasan et. al learning is needed to develop students' self-study capacity, it potentially promotes the acquisition of critical thinking skills, higher-order thinking, in which the teacher acts as a facilitator of learning [6], [7], [9], [13], [22].

The objectives of this study were (1) to determine the validity of the GAWI MANUNTUNG learning model based on local wisdom so that it is feasible to use; (2) determine the effectiveness of the learning model GAWI MANUNTUNG to improve high order thinking skills and digital literacy skills of elementary school students.

2 METHODOLOGY

Based on the problem to be solved, the study uses study methods in the form of study and development (R & D) or what is known as study and development in the field of education with the model proposed by Thiagarajan, Semmel, Semmel (1974). This study produced innovative learning model that are different from other products, both modified and new products to support work in the world of education and learning. This product allows the teaching and learning process to be optimal to achieve the expected goals. There are four phase of this study, there are development of learning model, Efficiency Investigation of learning model by 5 experts, quasi-experimental research to find the effectiveness of learning model to improve student's high order thinking skills and digital literacy skills.

2.1 Development Of Learning Model

Researcher start the study process from studying about the basic information about the learning process during covid-19 pandemic on elementary school, principles, concepts, literature, and related research for create the step of learning model. On this phase, researcher develop the learning processes and activities including the creation of research tool and assessment forms for learning activities and students high order thinking skills. The experimental tools are:

1 Lesson plan by combining between classroom face to face and online learning, design and organize learning activity that improve high order thinking skills and digital literacy skills with six lesson plan and investigate the appropriateness them by 5 experts.

2 Learning step consist of Group, Analysis and observation, Wondering observation result, Intensive data collection, Making experiment on outdoor, Analysis the result, Negotiation of solution, Using Technology, Necessity intelligences development, Task Product Creation, Unity on presentation and role play, Network Tournament and Games. Communicate between learners and teachers to do activities according to the learning management plan and deliver learning activities in each step.

besides that, researcher designs the collecting data tools are:

1 Learning outcome assessment form to be used to evaluate the student work result and rubric score assessment

2 Learning record and assessment form after the students do all activity to reflect learning result, self-assessment, and student opinion sheet about learning activities, which is divided into: (1)

issues related to learners, (2) instructors and media, (3) the appropriateness of activities and the duration of learning activities, (4) summary and evaluation of learning.

3 High order thinking skills assessment form consist of critical thinking, creative thinking, problem solving, logical thinking and analytical thinking was assessed during learning management by using rubric score assessment.

4 Digital literacy skills assessment form consist of information and data literation, communication and collaboration, and technology skills

Every assessment and evaluation tools were analyzed validity by four experts consist of lesson plan evaluation expert, learning step evaluation expert, learning outcome assessment evaluation expert, and high order thinking skills assessment evaluation expert. They will evaluate the assessment tools to find the index of consistency (IOC) by selecting question and questionnaire item that have validity between 0.05-1.00 considered the valid questions that can be used on the research.

High order thinking skills assessment to find the score of student's skills before and after learning with learning model GAWI MANUNTUNG according to [6], [7], [9], [13], [22]–[26], is the multiple-choice question of 50 items, with the Conbach's alpha score 0.86. The digital literacy skills according to [14], [18], [19], [27].

2.2   Validity Investigation Of Learning Model

The prototype of the learning model is investigated the quality and the validity by four experts using a questionnaire and suggestion sheet. The criteria for investigation of the quality and validity of the learning model created in each step must have a result that is not lower than the good criteria, with an average score from 3.00 up. Besides that, the researcher use the suggestions from four experts to improve every step of the learning model, lesson plan and assessment to be more quality. Then, the researcher using the developed learning model to pilot experiment with 500 students on elementary school, which are non-sample groups consist of 5 school as the representative in every regency (Hulu Sungai Selatan, Hulu Sungai Tengah, Hulu Sungai Utara, Tapin and Banjar), academic year 2021/2022. The researcher also prepare the teaching observation sheet to guarantee the implementation all step of learning model GAWI MANUNTUNG, questionnaire for teachers, in order to analyze the feasibility of practice and the learning process, according to the used of learning model.

2.3   Quasi-Experimental Research to Find the Effectiveness of Learning Model

1 The population of this research is the fifth grade students on Hulu Sungai Selatan, Hulu Sungai Tengah, Hulu Sungai Utara, Tapin and Banjar. The sample group for experiment used 10 elementary school in every regency. The students on 5 elementary school in every regency was treated using the learning model GAWI MANUNTUNG, and other 5 elementary school treated by direct instruction learning.

2 Research tool, used the developed tool and improved the quality from the phase 1 of the experiment

3 The research scenario to be a quasi-experimental research, One group pretest-posttest design was conducted as the following steps:

a) Preparation before teaching and learning process with orientation about learning strategy, mapping students group, register and practice using the Zoom Meeting, Google Meet, application of learning media (Baramian App). After that, the researcher allow the students to do measurement of high order thinking skills before study

b) Conduct teaching according to the developed learning GAWI MANUNTUNG, which is a combination of face to face and online learning using activities for students as the planned. Learning step consist of Group, Analysis and observation, Wondering observation result, Intensive data collection, Making experiment on outdoor, Analysis the result, Negotiation of solution, Using Technology, Necessity intelligences development, Task Product Creation, Unity on presentation and role play, Network Tournament and Games. After that, the researcher collect data and evaluate during learning process.

c) Measurement of high order thinking skills after completing the experiment

d) Measurement of digital literacy skills after completing the experiment

e) The researcher measures of the high order thinking skills and digital literacy skills after the students are finished study.

4 Data collection from learning process use various instrument, includes various events that occurred during teaching and learning by recording and assessment forms after the discussion and commenting with group members, work pieces stored in the Google Classroom and Google Drive, and presentation of learning outcome in the classroom.

5 Data analysis, the researcher analyze all of the data collection as follows :

   a) Learning outcome, the researcher use the students work result, find the average and standard deviation, and translate the mean value into learning level.

   b) High order thinking skills assessment as critical thinking, creative thinking, problem solving, logical thinking and analytical thinking by finding the mean and standard deviation and translating the mean to each skill level and compare with the criteria and interpret the meaning as the setting and concluded that the students have the level of learning skill for each level.

   c) Digital literacy skills assessment as information and data literation, communication and collaboration, and technology skills by finding the mean and standard deviation and translating the mean to each skill level and compare with the criteria and interpret the meaning as the setting and concluded that the students have the level of learning skill for each level.

   d) Score of the higher order thinking skills and digital literacy skills test before and after study, analyzed by finding the mean and standard deviation, comparing the average score before and after learning by using t-test in a single sample group.

6 Conclusion of student's skills based on the developed learning model. Evaluation of effectiveness the learning model GAWI MANUNTUNG that use on the learning activities to develop students high order thinking skills and digital literacy skills, the characteristics as follows students have an average score from the higher order thinking skills test after study higher than before study at .01 level of significant.

3 RESULTS

3.1 Development Learning Model GAWI MANUNTUNG

The development stage begins with the define stage by collecting information to analyze the needs at 10 elementary school on 5 regency in sout Kalimantan. Information is collected through five analytical activities (front-end analysis, learner analysis, teacher analysis, skill development analysis, and (specifying instructional objectives).

Product development begins with determining the substance of the learning model GAWI MANUNTUNG. The GAWI MANUNTUNG model is a learning model that combines virtual or online learning and face-to-face but is accompanied by activities to improve critical thinking, creative thinking, problem-solving, analytical thinking, and logical thinking. The design of the learning GAWI MANUNTUNG is as follows:

Table 1. The syntax of learning model GAWI MANUNTUNG.

Syntax	Implementation
Group,	Students will collect their friends in the group. Activity started with the teacher give the apperception. Teacher will tell the background of the topic, we can use the story telling method, show the picture, audio or the video.
Analysis and observation,	the teacher will provide more specific learning content to explore environmental issues associated with the South Kalimantan area. Students will be asked to analyze what will happen if the problem is left alone. Then students and groups will discuss the best solution to the problem being discussed
Wondering observation result,	Student will discuss the result from observation on the group. Then students and groups will discuss the best solution to the problem being discussed. Furthermore, students will be directed to analyze what will happen if the solution is applied.
Intensive data collection,	Students will work together to identify each item of question related to trying / gathering information until they have enough information. They collect data from the environment.
Making experiment on outdoor,	Students will be directed to carry out physical activities that will train students to test the results of reasoning about the solutions given with friends in the group. Physical activity consists of exploring things that can be found on the student's environment.

Analysis the result,	The group will investigate critically, systematically, and logically so that they can formulate their own findings confidently. The teacher will provide an explanation through the Google Meet or Zoom Meeting application so that all students can listen to detailed directions from the teacher
Negotiation of solution,	Students will negotiate with friends in the group. Negotiations started with the teacher distributing number cards with different problems, the cards were given in the Whats App application group in the form of pictures.
Using Technology,	This model need us to use the technology on learning process, we can use more device to make the student's enjoy and happy along the learning process.
Necessity intelligences development,	On this model, we can develop more student intelligences. We can improve linguistic, logical-mathematic, spatial, bodily kinesthetic, musical, interpersonal and intrapersonal intelligence.
Task Product Creation,	Student will be delivered to do project related with the topic. student projects involve the environment as a source of equipment. students will collect a variety of objects that can be used to create a teacher led project
Unity on presentation and role play,	This activity is filled with illustrating events related to subject matter that involve students as the main actors in it. The delivery of illustrations is carried out in the form of a story as well as provoking enthusiasm of students in practical activities through movements and words.
Network Tournament and Games	The game is designed to be flexible, not bound by rules. The game is intended to provide fun activities for students even though they are studying online at home. The game is designed to give students the opportunity to interact with each other, either by using the WhatsApp, Google Meet or Zoom Meeting applications.

3.2 The Efficiency Investigated of Learning Model GAWI MANUNTUNG

The efficiency of the learning model step design that has been compiled is then validated by lesson plan evaluation expert, learning step evaluation expert, learning outcome assessmen evaluation expert, high order thinking skills assessment evaluation expert, digital literacy skills assessment evaluation expert and with construct validity was at a very good level (X= 4.58) (SD = 0.12) and can be used to achieve the objectives of the learning model (see Table 2).

Table 2. The Efficiency Investigated of Learning GAWI MANUNTUNG by Experts.

Evaluation Aspect	Result		
	$\bar{X}$	S.D.	Efficiency Level
The concept of Learning Model	4.65	.548	Very Good
The objective of Learning Model	4.68	.548	Very Good
Context Analysis	4.66	.548	Very Good
Preparation before study	4.59	.548	Very Good
Learning by using learning model GAWI MANUNTUNG			
Online Learning			
a. Group,	4.50	.548	Good
b. Analysis and observation,	4.50	.548	Good
c. Wondering observation result,	4.50	.548	Good
d. Intensive data collection,	4.60	.548	Very Good
e. Analysis the result	4.61	.548	Very Good
f. Negotiation of solution	4.50	.548	Good
g. Using Technology,	4.50	.548	Good

Face to face learning			
a. Intensive data collection	4.62	.548	Very Good
b. Making experiment on outdoor	4.65	.548	Very Good
c. Task Product Creation,	4.65	.548	Very Good
d. Unity on presentation and role play,	4.67	.548	Very Good
e. Necessity intelligences development	4.45	.447	Good
f. Network Tournament and Games	4.55	.548	Very Good
g. Measurement and Evaluation	4.52	.548	Very Good
h. The possibility to utilize learning model GAWI MANUNTUNG to increase student's high order thinking skills	4.67	.548	Very Good
i. The possibility to utilize learning model GAWI MANUNTUNG to increase student's digital literacy skills	4.68	.548	Very Good
Average	**4.58**	**.120**	**Very Good**

In addition, according to experts, there are dissimilarities between lesson plans and teaching materials. The activities written in the student's lesson plan only make study visits. This is because the study visits are carried out outside of class hours so they are not included in the learning activities written in the lesson plans, but the directions for conducting study visits are explained in the closing part of the lesson plans. Home visits study are more effective and efficient when carried out outside class hours so that they do not interfere with class hours. Study visits outside of class hours are not limited by class hours so that students can explore more knowledge related to burnt batik and can use study time effectively and efficiently. After the revision was made according to the input, the validation was declared feasible by the three experts, this was because improvements had been made in accordance with the suggestions from the experts.

3.3 Results of Used Learning Model

Students high order thinking skills investigated by using the test of critical thinking, creative thinking, problem solving, logical thinking and analytical thinking after study which is the same version that the students have done before teaching and learning. The digital literacy skills investigated by using the test of information and data literation, communication and collaboration, and technology skills.

The results of analysis the high order thinking skills and digital literacy skills, students reach the higher order thinking skills and digital literacy skills after learning, according to the overall was at very good level. And when considered in each skill was found that learners with the highest level skills in attributing and checking skills (see Table 3) and from post-test scores, found that learners had high level of high order thinking skills and digital literacy skills after learning, developed in all skills at .01 level of significant (see Table 4). Based on the evaluation of the high order thinking skills and digital literacy skills scores after the study, shows that learning through learning GAWI MANUNTUNG can help improve students skills (see Table 3).

Table 3. Student's High Order Thinking Skills and Digital Literacy Skills After Study.

Skills	Result		
	$\bar{X}$	S.D.	Competency Level
Problem Solving	4.61	.54	Very Good
Critical Thinking	4.58	.48	Very Good
Creative Thinking	4.59	.49	Very Good
Analytical Thinking	4.76	.46	Very Good
Logical Thinking	4.68	.59	Very Good
information and data literation	4.56	.41	Very Good
communication	4.51	.50	Very Good
collaboration	4.66	.56	Very Good
technology skills	4.54	.44	Very Good
Average	4.61	.49	Very Good

Other data obtained from large-scale trials are the assessment of the implementation of learning and student learning outcomes.

Table 4. N Gain Analysis the pre test and post test after six meetings experiment.

Skills	Items	N = 500				t	p*
		Pre-test		Post-test			
		$\overline{X1}$	SD.1	$\overline{X2}$	SD.2		
Problem solving	8	1.65	.679	4,78	.712	14.102	.000
Critical thinking	8	2.57	.999	4,78	.891	-15.434	.000
Creative thinking	9	2.64	.532	4,54	.752	-15.832	.000
Analytical thinking	9	1.57	.588	4,56	.712	-14.699	.000
Logical thinking	8	2.55	.465	4,55	.794	-17.954	.000
Information and data literation	8	2.65	.679	4,78	.712	14.102	.000
Communication	8	2.57	.588	4,56	.712	-14.699	.000
Collaboration	9	2.64	.532	4,61	.752	-15.832	.000
Technology skills	8	1.55	.465	4,65	.794	-17.954	.000
Average score		2.22	.614	4,64	.759	-9355	.000

The increase of high order thinking skills and digital literacy skills is dominated by the "high" category because the learning presented provides very high motivation to students. The learning process is also not dominated by the transfer of knowledge in the form of theory, but students are brought to participate in learning with a variety of collaborative and independent information mining activities. Students are also led to exploring various problems that occur around them so that they are not required to memorize theories that make learning less meaningful.

3.4   Discussion

The learning model GAWI MANUNTUNG is a solution to overcome learning problems of the post COVID-19 pandemic. The learning model GAWI MANUNTUNG is an alternative solution to develop students' skills even though learning is only carried out online. This condition line with the research results of Agusta & Noorhapizah (2020) that the learning process must run optimally even though teachers and students interact online. The learning model GAWI MANUNTUNG is also an alternative solution for developing student skills that can be used by teachers as a reference because according to research by Noorhapizah, Agusta and Pratiwi most teachers still have not mastered the concept of skills that elementary school students must have and have not been able to package learning containing thinking skills. high level [20].

The development of the GAWI MANUNTUNG learning model is carried out based on the demand to produce elementary school graduates who can think at a higher level. Higher-order thinking skills have an impact on students' ability to think deeply and consider various problem solutions quickly, precisely, and accurately [5], [7], [10]. Students who are trained to think at a higher level will have speed and accuracy in solving problems, able to argue or communicate with various points of view to solve problems [5], [7], [10].

Every students reach very good criteria in evey aspect of high order thinking skills and digital literacy skills. Aspects of critical thinking and information and data literation in this study increased significantly. This is because learning is designed with directions following indicators of critical thinking skills and how to find and access the information. The importance of critical thinking skills and information and data literation has become the basis for researchers to develop the GAWI MANUNTUNG learning model, several learning steps that include activities for developing critical thinking skills, namely Analysis and Observation activities, Wondering observation results, Intensive data collection, and Negotiation of Solutions. Students are also guided to carry out the critical thinking process and information and data literation intensively. Students are guided to recognize different ways of critically analyzing and developing questions and answers from multiple perspectives. With the guidance of teachers and students feel challenged to explore in-depth information and look at various problems and solutions from various sides [7], [9], [13], [14], [19], [28], [29].

Learning is also directed to foster creative thinking, communication and collaboration skills. This can be seen from the percentage gain with the high category very dominating. This is because learning is provided with clear directions and communicative learning resources and contains detailed narrative directions for various activities, making students less dependent on the teacher. A very encouraging condition was that at the last meeting students explored alternative problem solving through projects, in this activity they did not need teacher guidance. They are very enthusiastic about arguing to contribute creative thinking to solve current problems and provide a thorough explanation of the completed projects. The learning process carried out by researchers uses activity designs that can train students' creativity starting from the stage of doing Analysis and Observation, Wondering observation results, Analysis of the result and Making experiments on outdoor by opening students' horizons by presenting a problem in everyday life. The efforts made by the teacher are in line with previous research that learning that poses various problems can increase students' creativity because it is done by broadly developing students' ideas through displaying problems [7], [9], [13], [14], [19], [28], [29].

The aspect that also important in this study, namely problem solving and communication. This is because all indicators of problem-solving skills and storing data and information are peeled off one by one and developed for all students through the guidance of teachers and students. All students feel challenged to explore the problems that occur and find alternative solutions to problems with friends in the group. Teachers and students give appreciation and reinforcement to students' abilities to explore and solve problems, even though the results obtained are not too perfect. This appreciation and reinforcement from the teacher also provoke students' motivation to always try and try without fear of making mistakes. The activity steps of Analysis and Observation, Wondering observation result, Analysis of the result, and Making experiments outdoor can also develop problem-solving skills. The development of students' creative thinking skills is continued in Necessity intelligence development and Task Product Creation activities. This is in line with previous research which states that problem-solving skills can be developed by asking questions or allowing students to make questions from observations [11], [27], [30], providing opportunities for students to explore problems that are happening from observations [6], [21], opens students' horizons using concrete and diverse objects[11], [27], [30], uses the surrounding environment as an object of observation [11], [27], [30] involves students providing arguments to answer various questions [18], [30], [31]. In addition, the Task Product Creation activity will familiarize students to acquire their knowledge as research states through solving problems by utilizing the surrounding environment (outdoor learning). Learning [6], [7], [18], [32]. Through this activity, in addition to having creative abilities, students will also have scientific literacy skills that are in line with research by Nursofah, Rahayuni, Vieira, and Tenreiro that natural learning outside the classroom can improve science mastery and literacy of elementary school students [6], [7], [14], [18], [19], [32].

Another aspect that also continues to increase is logical thinking, analytical thinking and technology skills. A significant increase occurred in a short time because it was carried out with intensive guidance from teachers and students. Learning is directed at extracting information about problems that arise in the surrounding environment or that are familiar among them so that their logical and analytical thinking can be developed easily. This makes it easier for students to recognize the problems that occur. The activity is continued by looking for alternative problem-solving with colleagues in the group. This activity is also designed to be as attractive as possible even though it is only carried out online through the Zoom Meeting, Google Meet, or WhatsApp pages. This becomes a new routine for students so that it provokes student motivation and has an impact on increasing the quality of learning significantly. One of the learning steps that can develop these two skills is Analysis and observation. In this activity, the teacher will provide learning content that is more specific to exploring environmental issues related to the South Kalimantan area. Students will be asked to analyze what will happen if the problem is left unchecked, thus students are trained to reason about the possibilities that will occur so that analytical thinking skills begin [6], [7], [14], [18], [19], [32]. Then students and groups will discuss the best solution for the problem being discussed. Furthermore, students will be directed to analyze what will happen if the solution is applied. This activity will train students' logical thinking skills [5]–[7], [14], [18], [19], [32]. In addition to the Analysis and observation activities, logical and analytical thinking skills are developed in the steps of Wondering observation result, Analysis of the result and Making experiment on outdoor. This is because these 2 activities will train students to give and receive information, express opinions or arguments in groups, respond to statements from friends in groups during discussions, explain what will and have been done in groups, receive information provided by group friends properly. and give a positive response even though there are differences of opinion. This is in line with the development of analytical thinking skills [5]–[7], [14], [18], [19], [32].

4 CONCLUSIONS

Based on the results of study and discussion, it can be concluded that: (1) the GAWI MANUNTUNG learning model based on local wisdom is feasible to use in the learning process; (2) GAWI MANUNTUNG's learning model based on local wisdom is able to improve critical thinking skills, creative thinking, problem solving, logical thinking and analytical thinking.

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THE EFFECTIVENESS OF LEARNING MODEL GAWI MANUNTUNG