Analysis of Students' Digital Literacy Abilities with the Implementation of *Project-Based Learning* Model in Elementary Schools

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Abstract

The aim of this research is to improve the digital literacy skills of Class V students at SDN 02 Bengkayang in the science and sciences subject by implementing the Project-Based Learning model. Apart from that, this research aims to increase teacher creativity in the learning process. The research used is Classroom Action Research (PTK), data collection instruments used include digital literacy skills tests, student and teacher activity observation sheets. In the Pre-Cycle research results, students' scores could be categorized as not having achieved completeness with a percentage of 0%, the KKTP for science and science subjects in class V was 70. In the first cycle the number of students who achieved completeness was 23 students with a percentage of 82.14% and in the second cycle the number of students who achieved completeness increased to 28 students with a percentage of 100% and in the second cycle all students could be categorized as achieving completeness. Apart from that, teacher activities in implementing learning in cycle I with a percentage of 61.41% increased to 84.61%. Student activities in cycle I with a percentage of 53.84% to 76.92%. So, the average number is 65.38%. Based on the results of this research, it can be concluded that the Project Based Learning model can influence science learning to increase students' digital literacy with Biotic and Abiotic material in class V SDN 02 Bengkayang

Keywords: Social Studies, Digital Literacy, Project Based Learning.

Abstract

The purpose of this study is to improve the digital literacy skills of Class V students of SDN 02 Bengkayang in the subject of social studies by applying the Project-Based Learning model. In addition, this research aims to increase teachers' creativity in the learning process. The research used was Classroom Action Research (PTK), the data collection instruments used included digital literacy ability tests, observation sheets of student and teacher activities. In the results of the Pre-Cycle research, student scores can be categorized as not reaching completeness with a percentage of 0%, the KKTP of science subjects in class V is 70. In the first cycle, the number of students who achieved completeness was 23 students with a percentage of 82.14% and in the second cycle the number of students who achieved completeness increased to 28 students with a percentage of 100% and in the second cycle all students can be categorized as achieving completeness. In addition, teachers' activities in carrying out learning in the first cycle with a percentage of 61.41% increased to 84.61%. Student activities in the first cycle with a percentage of 53.84% to 76.92%. So, the average number is 65.38%. Based on the results of the study, it can be concluded that the Project Based Learning model can influence social studies learning to improve students' digital literacy with Biotic and Abiotic materials in grade V of SDN 02 Bengkayang.

Keywords: IPAS, digital literacy, project-based learning.

Introduction

Digital capabilities are the ability to understand, provide, create, and identify information. Digital skills help students understand technologies such as cell phones, computers, laptops, and internet networks. All of this aims to improve our ability to

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effectively find information, choose the right meaningful information, and avoid bad information, as we keep up with the changing age of digital literacy. It is communicated not to be abused in the digital age if it is understood that it can provide benefits according to the digital age. Digital Capabilities help provide the desired learning resources (Naufal, 2021).

Digital capabilities are the most important ability that today's generation should have. Digital literacy skills can make children wiser in determining information and disseminating information Finding the internet network remains difficult and there are still many schools in rural areas, especially in remote areas with limited access to technology in the world of education, it is very difficult for teachers to use digital technology. School infrastructure is still very limited, teacher training is still lacking, and technical integration into learning is still lacking. Schools, especially remote locations, need support to develop digital skills so that the perception of technology-based learning is not hampered. In existing facilities, obstacles to the development of students' digital literacy may exist in the learning process. With students having extensive technological tools and proper internet access, there is still a limited willingness to face the challenges of today's world of education. (Rahmasiwi et al., 2023).

Students can study independently to learn additional people. The ability of digital literacy skills in the Bengkayang area still has a low impact on education. Limited facilities for teachers and training are not enough to use all digital technology in the learning process. One of the efficient teaching methods used in schools is *the Project Based Learning* method . The *Project Based Learning* method can increase learning achievement, increase enthusiasm, and encourage students to be creative and independent in creating products. In addition, this method provides an experience for learners to build knowledge and improve skills in delivering the resulting product. Digital literacy at SDN 02 Bengkayang is still low due to limited facilities and infrastructure such as (Nita & Irwandi, 2021) *mobile phones*, laptops, computers, and projectors so that they are not enough to help the learning process. Digital literacy plays an important role in shaping generation Z as independent learners who are able to think critically (Saenab et al., n.d.; Saputra et al., 2024) .

The internet network at SDN 02 Bengkayang already exists such as the mobile network and *wifi* while the mobile network can be accessed anywhere and *the wifi* at SDN 02 Bengkayang is very limited, not all school environments are reached by the *wifi* network . The lack of digital technology tools such as *mobile phones*, laptops, and computers is very minimal, this can also be an obstacle to developing digital literacy. The lack of teacher training can be an obstacle to providing an effective source of learning innovation to showcase something new. The lack of technology at SDN 02 Bengkayang is an obstacle to using digital tools to support the learning process. The Project-Based Learning Model has been shown to improve students' critical thinking, collaboration, and digital skills very effectively. In addition, this approach encourages students to be more proactive in seeking information and utilizing various digital technologies during the learning process. The importance of a learning model that can overcome a problem in the learning process by using *the Project Based Learning* model can help overcome digital literacy problems at SDN 02 Bengkayang. By applying *the Project Based Learning* model. The active learning model is a fun and collaborative way students can work together. The relationship between *Project Based Learning* and digital literacy is very close because this approach helps students use technology critically and creatively. In *Project Based Learning*, students are directed to use technology in finding information. Students are guided in finding and using information, as well as evaluating it to improve the digital literacy skills of SDN 02 Bengkayang students. Through the project-based learning model, students are taught to use digital technology. This activity helps students improve, develop, and solve problems,

digital literacy will be necessary in the technological era. IPAS learning in elementary school is an integrated learning approach that combines natural sciences and social sciences (Indriani, 2020)   (M. Arifky et al., 2024).

The goal is to provide students with a comprehensive understanding of the universe, human life, and the interaction between the two. Digital skills are a person's skill in properly utilizing digital tools to easily access, organize, integrate, evaluate, and analyze digital resources to build new knowledge, create means for expression, and use digital resources in daily interactions with others in that context. The project-based learning model is one of the teaching methods designed based on the principles of constructivism, which requires learners to build their own understanding. *Project Based Learning* is a learning model that uses projects. The project-based learning model is seen as one of several models defined as a learning approach that requires students to be actively involved in planning and producing works that function as a result of the learning process   (Giatman & Dedy Irfan, 2019) (Handari et al., 2024).

Method

This study uses the Classroom Action Research (PTK) method because this method can help teachers and students to apply *the Project-Based Learning model.* Classroom action research is an effort to assess the learning process carried out in the classroom environment (Udil, 2021) . The results of the study stated that applying *the Project-Based Learning* model can improve students' digital literacy skills. The use of the Project-Based Learning model can improve students' creative thinking skills This research population was carried out at SDN 02 Bengkayang, Bengkayang Regency with 28 students in grade V (five). The research sample consisted of 16 male students and 12 female students. The object of this study aims to improve students' digital literacy skills by using   (Khauzanah et al., 2023). *the Project-Based Learning* model in science subjects for grade V at SDN 02 Bengkayang. Data collection is carried out by test and observation activities. Observation is an activity to see the situation and situation   (Dewi Anggraini P, Sri Wulandari, 2021)   .

Observations were carried out to obtain data on digital literacy skills. Meanwhile, the test is carried out to obtain data on student learning outcomes. Learning success observation sheets can be made at the same time as learning activities according to the teaching module. The interaction between teachers and students increases because teachers are required to guide students in solving problems and pay more attention to students who need special attention in the learning process so that they can actively participate in learning This instrument is used to measure the implementation of the   (Ayu Sri Wahyuni, 2022). *Project-Based Learning* model. The test instrument used was in the form of project questions. This study uses observation techniques and test techniques Observation techniques in this activity the researcher conducts initial activities to observe the teaching and learning process in the IPAS class V class and find out how the class teacher carries out learning in the classroom. Test Technique Test instruments are used to measure the results of students' digital literacy abilities in grade V of SDN 02 Bengkayang. Data collection to improve the digital literacy of grade V students is carried out through the project. Observation strategies are used to understand digital literacy and to apply   (Faridah et al., 2022). *the Project-Based Learning* model in teaching and learning activities. Data analysis in this study uses observation and tests. Data collection was carried out by pre-test and post-test in the class that was sampled   (Nurhadiyati et al., 2020)   .
1. Analysis of Learning Achievement Observation Data

Data analysis of the results of observation of learning outcomes using scores of 0 and 1. A score of 0 applies to tool elements that are not executed. The percentage of evaluation of the results of the learning success monitoring tool is as follows:

$$\text{Percentage of achievement} = \frac{Banyak\ Item\ yang\ terlaksana}{Total\ Keseluruhan\ Item} \text{ x } 100$$

2. Digital Literacy Ability Test Instrument Analysis

The analysis of student learning achievement was carried out by comparing learning outcomes with the minimum achievement standard (KKTP) determined by the school, which is 70. Actions higher than baseline scores, KKTP success can be measured by calculating individual graduation rates and traditional graduation rates. Average analysis Student learning outcomes are assessed by comparing their average performance before and after the intervention. An increase in average learning outcomes guarantees success in this measure.

The formula for calculating the average is:

$$\text{KI} \frac{SHB}{SMI} \times 100\% \qquad \text{(Sussex, 2009).}$$

Information:

IP = Individual Completeness

SHB = Learning Outcome Score

SMI = Ideal Maximum Score

Meanwhile, the percentage of students who achieve the Learning Goal Achievement Criteria (KKTP) can be calculated using the following method:

$$\text{CD} \frac{JST}{JS} \times 100\% \qquad \text{(Sussex, 2009)}$$

Information:

KK = Percentage of Classical Completeness

JST = Number of students completed

JS = Total number of learners

Furthermore, an assessment was carried out on the average student learning outcomes by comparing learning outcomes before and after the action. The success of this measure can be ensured if the average learning outcomes increase (Rezeki, 2009).

The formula used to calculate the average is:

$$\bar{X} = \frac{\sum X}{N}$$

Information:

$\bar{X}$ = average

$\sum x$ = sum of the entire score

N = number of subs

Results and Discussion

Result

Cycle I will be held on April 10, 14, and 15, 2025 and Cycle II will be held on April 16 and 17, 2025. Table of Data The recapitulation of the research results can be presented in Table 1.

Table 1. Recapitulation of Research Results

Information	Frequency		
	Before Action	Cycle I	Cycle II
Average Score	59,89%	82,85%	100%
Completed Students	0	23	28
Completion Percentage	0%	82,14%	100%
Students are not complete	28	5	0
Incomplete Percentage	100%	17,86%	0%
Teacher Activities	-	61,41%	84,61%
Student Activities	-	53,84%	76,92%

Based on the results of observations made during the learning process, there was a significant increase in the activity of teachers and students between cycle I and cycle II. From the results of observation, teacher activities can be seen to increase in the first cycle, which was initially 61.41% in the second cycle, increased to 84.61% from the first cycle to the second cycle, which can increase to 23.2%. The results of student observation were seen to increase in the first cycle which was initially 53.84% in cycle II increased to 76.92% can increase to 23.08%. Observation of teachers' activities with an overall average of the first cycle and the second cycle reaching 73,01%. Observation of student activities with the overall average of cycle I and cycle II reaching 65,38%. This indicates an improvement in the quality of learning implementation carried out by teachers and students. Thus, the overall results of teacher observation data and student observation in each cycle show an increase in the implementation of learning. Observation is a step to observe situations and conditions (Dewi Anggraini & Sri Wulandari, 2021)

Discussion

Before testing, it can be seen from the test results that were determined about biotic and abiotic materials were still low. Pre Test scores can be presented in Table 2.

Table 2. Pre Test Scores

KKTP	Frequency/student	Completeness	Percentage
>70	0	Conclusion	0%
<70	28	Incomplete	100%

The table above can show the pre-test scores of grade V students of SDN 02 Bengkayang that all students are declared unable to achieve the predetermined Learning Goal Achievement Criteria (KKTP), which is 70 in the science subject, so that the percentage of completeness is 0%, the percentage of incomplete is 100%, and the average

score is 59.89%. The results of observation of learning achievement in cycle I can be presented in Table 3.

Table 3. Results of Learning Achievement Observation in cycle 1

Activities	P1	P2	P3	Average
Teacher Activities	53,84 %	61,53%	69,23%	61,41%
Student Activities	46,15%	53,84%	61,53%	53,84%

Information:

P1 = Learning 1

P2 = Learning 2

P3 = Learning 3

The results of observation of teacher activities in cycle 1 were considered very good with an average of 61.41%. The results of the observation of student activities in cycle 1 showed an average score of 53.84. At the next meeting, there are several activities in learning that need to be improved so that they can run well. The results of completeness in cycle I can be presented in Table 4.

Table 4. Completeness of Cycle 1

KKTP	Frequency	Completeness	Percentage
>70	23	Tuntas	82,14%
<70	5	Incomplete	17,86%

The results of the test score in cycle 1 showed that the average score of IPAS was 82.85% with the highest score of 80 and 100, the number of students who completed 23 people with a completion percentage 82,14% and the lowest score of 52 with the number of students who did not complete 5 people with the percentage of incomplete 17,86%. Learning Goal Achievement Criteria (KKTP) 70. Meanwhile, the observation sheet of teachers' activities 61.41% and observation sheet of student activities 53.84%. Thus, the learning outcomes of researchers in cycle 1 have not met the success target. This research will continue to the second stage by utilizing the results of reflection as a basis for making improvements. The results of observation of learning achievement in cycle II can be presented in Table 5.

Table 5. Observation Results of Learning Achievement in Cycle II

Activities	P1	P2	P3	Average
Teacher Activities	76,92%	84,61%	92,30%	84,61%
Student Activities	69,23%	76.92%	84,61%	76,92%

Information:

P1 = Learning 1
P2 = Learning 2

P3 = Learning 3

The results of observation of teacher activities in cycle II were considered very good with an average number of 84.61% of teachers still not giving appreciation, good motivation to students has been optimized by teachers to manage learning in the classroom such as directing students to form groups because students can be directed in group formation and can be improved at this meeting. Results of observation of student activities in cycle II showed average scores 76,92%. At this meeting, students are optimal when listening and understanding the learning material and students have begun to actively ask questions. At this meeting, activities in learning can increase well. The results of completeness in cycle II can be presented in Table 6.

Table 6. Completion of Cycle II

CD	Frequency	Completeness	Percentage
>70	28	Conclusion	100%
<70	0	Incomplete	0%

The criteria for achieving Learning Objectives (KKTP) are 70 in science subjects. Students are declared complete when they reach the specified KKTP. The table above explains that 28 students were declared complete in the IPAS subject, the percentage of completeness was 100% and the percentage of incompleteness was 0%. The learning results in cycle II are optimal, so it is stated that maximum results can be obtained. The results of the test scores in cycle II showed that the average score of IPAS was 100% with the highest score of 100 students who completed 28 people with a completion percentage of 100%. The percentage of incomplete is 0% and all students can achieve completeness because they can achieve the Learning Goal Achievement Criteria (KKTP) which is 70. Meanwhile, the observation sheet of teacher activities was 84.61% and the observation sheet of student activities was 76.92%. Thus, the learning achievements of researchers in cycle II can achieve success. Thus, the results of this study are considered to have met the completeness target in cycle II. The results of obseobservations per cycle can be presented in table 7.

Table 7. Observation Results Per Cycle

Activities	Cycle I	Cycle II	Average
Teacher Activities	61,41%	84,61%	73,01%
Student Activities	53,84%	76,92%	65,38%

Based on the results of observations Teacher activities were seen to increase in the first cycle which was initially 61.41% in the second cycle increased to 84.61% from cycle I to cycle II can increase to 23.2%. The results of student observation were seen to increase in the first cycle which was initially 53.84% in cycle II increased to 76.92% can increase to 23.08%. Observation of teachers' activities with an overall average of the first cycle and the second cycle reaching 73,01%. Observation of student activities with the overall average of cycle I and cycle II reaching 65,38%.

Limitations

This research was conducted in a limited time span in accordance with a predetermined research schedule, so that the implementation of learning by applying *the*

Project-Based Learning (PjBL) learning model among students was not able to fully demonstrate students' understanding of improving digital literacy skills, both in terms of understanding concepts, technical skills, and critical attitudes in the wise and responsible use of digital technology.

Conclusion

The improvement of students' digital literacy skills can be seen from the results of pre-action and post-action scores and this can be seen from the aspect of teacher and student observation during learning. Based on the results of the Classroom Action Research students' digital literacy skills in this study carried out in two cycles with a research model *Project-Based Learning* Efforts to improve students' digital literacy can be concluded that the application of the *Project Based-Learning* can have a good influence on improving students' digital literacy. The results of the observation of teacher activity learning in the first cycle, teacher involvement in learning activities with a percentage of 61.41%, while in the second cycle it increased to 84.61% and the average score of teacher activities with a percentage of 73.01%. The results of the observation of student activity learning in cycle I with a percentage of 53.84% while in cycle II it can increase by a percentage of 76.92% and the average score of student activities with a percentage of 65.38%. Improvements can be seen when implementing Pre-cycle, Cycle I, and Cycle II. The average score in the Pre-cycle has changed drastically from 82.85% in the first cycle to 100% in the second cycle. The number of students who experienced completeness in the first cycle was 23 students who completed with a percentage of 82.14% and in the second cycle there were 28 students who completed with a percentage of 100%. The implementation of this research was carried out for two cycles, cycle I which began on April 10, 14, and 15, 2025 and ended in cycle II which began on April 16 and 17, 2025. When carrying out the stages of the model cycle *Project Based Leraning* It can also hone students' ability to edit learning videos. The activities carried out in each cycle are proven to have good changes to student learning so that students can be enthusiastic about learning, have a sense of responsibility, be creative, and innovative to work in education by utilizing existing facilities. After the Pre-cycle/before the action is taken, the student's score cannot reach the KKTP and after the first cycle is implemented, the student's score can increase even though not all of them reach the target of the provisions and the student is less active. Furthermore, in order for student scores to reach KKTP, cycle II is carried out, in this second cycle student scores can increase drastically and all students actively participate in doing group assignments so that project tasks can be completed according to the predetermined time. Students' digital literacy is said to be increasing as can be seen in the number of students who achieve completeness in each cycle. In the Pre-Cycle there is no completion, in the first cycle 23 students completed with a percentage of 82, 14%, and in the second cycle all students can achieve completeness with a percentage of 100% completion. From the results of the observation and test, it can be concluded that this skill improves with the model *Project Based Leraning*.

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