

The Impact of Project Literacy Learning on Creative Thinking Skills and Student Writing Literacy

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Abstract

Creative thinking skills and writing literacy of students in Indonesia are still in the low category. It is necessary to apply an appropriate learning model. This study aims to determine the impact of project literacy learning (lipro) on creative thinking skills and literacy of students. Lipro learning is a learning model that integrates project-based learning with literacy. The subjects of the study were 58 prospective physics teacher students. Creative thinking skills were assessed through video story telling products, while writing literacy skills were assessed through real action articles created by students. The results showed that creative thinking skills increased from 73.09 to 85.78. Writing literacy skills increased from 71.5 to 84.33. Based on the results of the paired sample T test, it was shown that students' creative thinking skills and writing literacy before and after lipro learning increased significantly.

Keywords: Project-based learning, Lipro, Creative thinking, Literacy, Writing

INTRODUCTION

One of the requirements of twenty-first century learning is that students must be able to apply the subject matter to solve everyday problems. Everyday problems in the student's environment are very complex and dynamic so that certain skills are needed. An important skill in solving everyday problems is creative thinking skills. Knowledge alone is not enough to face very tight international competition without creativity. Creativity will move a person to different perceptions, concepts, and entry points compared to others. Through creative thinking, a person can understand problems and find solutions with various strategies or methods (Kardoyo et al. 2020). Human resource development in recent years has also emphasized improving creative thinking skills (Gafour and Gafour 2020). Currently the world is developing very rapidly. Competition between people is also very tight. Only people who have high creative thinking skills are ready to compete. This is because people who have creative thinking skills are able to find ideas and solutions that are out of the ordinary or out of the box.

In addition to creative thinking skills, literacy skills are also one of the main aspects of education that must be strengthened in twenty-first century learning competencies. Especially in today's digital era, literacy skills are highly emphasized. Literacy affects almost all aspects of human life, so it needs to be instilled in students as early as possible. Literacy skills include various aspects, namely reading and writing literacy, numeracy literacy, science literacy, financial literacy, digital literacy, and cultural and civic literacy. The most important and basic literacy skills to be emphasized in students are reading and writing. Until now, the basic literacy skills of students in Indonesia are still lacking. In fact, reading and writing literacy skills have been given since elementary school. However, because the implementation has not been optimal, the results have not been as expected. Literacy learning is still rarely done, especially in science material. This is because understanding concepts is emphasized more than basic literacy skills. In this study, the author focuses on writing literacy skills, because this problem is still found up to undergraduate students in college. In fact, there are still some students who have low abilities in constructing correct sentences according to standard spelling. Basic writing skills Writing is actually an activity

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that can support student learning. This is because, through writing skills, students can interact mentally with the words in the subject matter (Chicho 2022). That way, through the activity of rewriting the lesson material, students will find it easier to understand and memorize the material. Writing skills also include how to apply text structure, make summaries, and use language (Whiskey 2017). So with the higher writing skills, students will also find it easier to understand the contents of the text or book they read. Until now, developing students' writing skills is one of the major challenges faced by educators today (Moses and Mohamad 2019).

The creative thinking skills and writing literacy of students in Indonesia are still relatively low on average (Putri et al. 2023). Although efforts to improve creative thinking skills have been carried out in learning both online and offline, the results have not been optimal (Auliyah et al. 2021)(Awaly et al. 2023). Common obstacles that are often faced are the unpreparedness of educators and students with learning that emphasizes more on student-oriented and creative thinking skills. So far, learning is usually based on lectures, memorizing theories, or applying existing theories. In addition, variations in learning models that can facilitate students to improve creative thinking skills are also not widely found. Meanwhile, literacy learning at school and college levels has not been implemented optimally. Some common obstacles faced in literacy learning are the lack of readiness of educators and students and time constraints (Dewi et al. 2022). In addition, literacy learning has not become a habit in the classroom. It is still rare for educators to give literacy assignments or projects to students.

This condition requires efforts to design how learning can improve creative thinking skills while improving students' writing literacy skills. Improving creative thinking skills can be done by integrating every aspect of skills into every learning experience in the classroom (Ernawati et al. 2023). Aspects of creative thinking skills, for example, are thinking fluently, flexibly, originally, and being able to explain. Creative thinking skills are not easily improved only through conventional learning, but should be centered on students (Habibi et al. 2020). This means that learning must provide students with experience in solving a problem based on their thinking. One learning model that can facilitate students to improve their creative thinking skills is project-based learning. In project-based learning, students learn by producing a problem-solving project. The results of this problem solving are obtained based on their exploration, discussion, and creative thinking.

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Lipro learning is learning that integrates project-based learning models and literacy learning. Lipro learning steps are arranged based on project-based learning steps and literacy learning which include activities to solve a problem, plan a project, prepare a project schedule, monitor project progress, assess the product, and evaluate. This project can be in the form of videos and articles. Creative thinking skills can be expressed by students through video story telling, while writing literacy skills can be demonstrated through articles. Through Lipro learning which includes student-focused activities, it is hoped that students' creative thinking skills and writing literacy can improve.

Research on the impact of project-based learning on students' creative thinking skills has been conducted (Putri et al. 2019) (Lukitasari et al. 2021). The results of previous studies have shown that project-based learning can improve creative thinking skills. Meanwhile, project-based learning in college is still not done as much as in elementary and secondary education. Learning that can improve students' writing literacy skills is still rarely done, especially in college. In addition, there has been no previous research that integrates literacy learning and project-based learning. Based on this background, the author intends to formulate a problem about how the application of the Lipro learning model impacts the creative thinking skills and writing literacy of prospective physics teacher students?

LITERATURE REVIEW

Project Based Learning

Project-based learning is highly emphasized these days especially in twenty-first century learning strategies. Project-based learning is an active method that develops maximum involvement and participation of students in the learning process (de la Torre-Neches et al. 2020). Project-based learning can facilitate students to develop various basic skills such as problem-solving skills, group work, scientific thinking, communicating discussion results, and others. The focus of project-based learning is that learning is based on active constructive science (Guo et al. 2020). This is because in project-based learning, students are given the opportunity to analyze and solve problems based on case studies, references they read, or based on the results of discussions with peers. In addition to being able to increase student involvement in learning (Muhajir et al. 2024), project-based learning has also been shown to improve student learning outcomes (Zulkifli et al. 2024). Project-based learning is a learning model that uses a scientific approach so that it will accustom students to the inquiry process (Sumarni 2015). However, project-based learning does not have to be applied to science subjects, but can also be applied to other subjects. Through project-based learning, students are expected to be able to increase their involvement in various knowledge and information (Almulla 2020). This can be accommodated through discussion and brainstorming activities with group members in project-based learning.

Project-based learning is a collaborative learning model that is very suitable to be developed. Through project-based learning, students not only grow intellectually but also personally (Crespí et al. 2022). This is very useful for student development, especially in facing the rapid development of technology and globalization. The skills acquired during project-based learning will be useful for students in facing the very tight competition in society. Project-based learning has been proven to have higher efficiency compared to visual verbal learning (Maros et al. 2023). Project-based learning with its student-focused characteristics certainly not only equips students with aspects of conceptual understanding, but can also improve various aspects of life skills that are useful for students to face the real world. The characteristics of project-based learning that specifically promote the use of collaboration, artifacts, technological tools, problem-centeredness, and certain scientific practices can encourage students to think creatively (Markula and Aksela 2022). Based on various previous studies, project-based learning has been proven to improve students' problem-solving skills and creative thinking skills (Albahiri et al. 2024). The increase in student creativity can occur because project-based learning contains steps for problem solving, project planning, and project creation where these activities require creative thinking exercises. The steps for project learning in general consist of: 1) opening learning with challenging questions, 2) planning a project, 3) preparing an activity schedule, 4) monitoring the progress of the project, 5) assessing the resulting product, and 6) evaluating (Educational Technology Division Ministry of Education 2019).

Literacy Learning

Literacy is a basic skill that students must have in the development of the twenty-first century. There are six types of basic literacy that must be mastered, namely reading and writing literacy, numeracy literacy, science literacy, financial literacy, digital literacy, and cultural and civic literacy. The most important literacy is reading and writing literacy. This is because reading and writing literacy is useful in all aspects of life. In a digital world, reading and writing literacy plays a very important role. Today, literacy has evolved from the ability to read and write to social practices that allow people to learn and interact with the world (Vidal et al. 2022). Literacy skills will be a provision for students to face real life in the era of globalization (Winarni et al. 2020). In addition, literacy skills can also create positive social change, because students will be better prepared to live and interact efficiently in society (Erwin and Mohammed 2022). A person who has high literacy skills will certainly be able to easily adapt and compete in today's era of globalization.

Literacy learning is learning that emphasizes improving students' literacy skills. Literacy-based learning is very important to implement to expand students' knowledge content and concepts in life (Harmoko 2021). Currently, literacy learning is often applied to language subjects (Zamzam et al. 2024). It is still rare for science subjects to include literacy elements in them. Through literacy, students are expected to be able to have the ability to create knowledge through writing on personal growth, synthesis, or reflection of new information (Afrilyasanti and Basthomi 2023). In literacy learning, the environment is an important aspect in supporting

students' literacy learning process. The literacy environment is very good for learning reading and writing literacy (Photo 2022). In addition to supporting the literacy learning process, the literacy environment greatly influences students' mindsets and personalities and forms superior character, personality, attitudes and behavior (Carolina et al. 2023). Thus, educators can organize the learning environment as well as possible as a means to support the implementation of this literacy learning.

Practical learning can be one strategy that can be applied to improve students' literacy skills (Tohani et al. 2019). In addition, literacy learning can be implemented through an integrated and enjoyable approach (Medina-Hinostroza et al. 2024). Problem-based learning, case presentations, portfolios, and clinical debates can also be used as alternatives to improve students' literacy skills (Hee, et al. 2019). Literacy learning steps according to Nuryati et al. (2021) includes: 1) orientation, apperception, and motivation; 2) stimulation, problem formulation, data collection, verification, and conclusion drawing; and 3) reinforcement, feedback, and closing. Literacy learning is still rarely implemented, especially in science materials. This is because the concept is more emphasized than students' basic literacy skills, such as writing skills. By understanding the consequences of poor literacy skills, students must be motivated to improve their literacy skills.

Creative Thinking Skills

One of the skills that students must have in the current era of globalization is creative thinking skills (Gafour 2020). Creative thinking is an important way of thinking to be able to solve increasingly diverse problems. In addition, creative thinking skills are also skills that can make someone survive in the midst of very tight global competition. Among the main tasks of science today is to support the development of student creativity under the influence of globalization (Botagariyev et al. 2023). Knowledge alone is not enough to face the very tight international competition without creativity.

Creative thinking is a student's ability to understand problems and find solutions using various strategies or methods (Kardoyo et al. 2020) (Aini and Narulita 2020). Through creative thinking, a person will be able to use various limited resources to support problem solving (Runisah et al. 2017). Besides that, creative thinking skills are also important for students to have in order to increase honesty (Eshet and Margaliot 2022). Therefore, it is increasingly clear that creative thinking skills are a very important skill for someone to have in order to succeed in facing the realities of life. This is because with the development of the era, problems in the real world are increasingly complex and require high integrity. Creative thinking is one form of high-level thinking (Mulyono et al. 2023). By having high-level thinking skills, students are able to solve problems, be creative, and make decisions about something. The criteria for creative thinking that are commonly used are: 1) fluency, 2) flexibility, 3) originality, 4) elaboration (Lukitasari et al. 2021).

Lipro Learning

Project literacy (Lipro) learning is a learning designed to improve students' creative thinking skills and literacy skills. Lipro learning integrates project-based learning models and literacy learning. Currently, students' creative thinking skills are still low. Project-based learning that includes various steps that are centered on students and problem solving is thought to be able to facilitate students to develop their creative thinking skills. In addition to reading skills, writing is also an important part of literacy skills. Currently, students' writing skills are still lacking (Moses and Mohamad 2019). Literacy learning is considered by the author to be still very relevant to be used to improve the aspect of students' writing skills. In order for learning to accommodate the improvement of aspects of students' creative thinking skills and writing literacy, Lipro learning is considered necessary to be applied in learning.

Lipro learning steps are adapted from the syntax of project-based learning integrated with literacy learning. The steps consist of: 1) orientation, apperception, and motivation; 2) stimulation in the form of questions; 3) planning a project; 4) making a schedule; 5) monitoring project progress; 6) assessing the product; and 7) evaluating, reinforcing, and providing feedback. In implementing Lipro learning, educators should first analyze student needs. In addition, educators also investigate the appropriate approaches, strategies, and media used in learning. Educators must be able to find and know the advantages and disadvantages of each decision chosen

in learning (Hidayah et al. 2021). In Lipro learning, students learn by designing and producing a product. Products can be videos, articles, image media, props, and others.

METHODS

Types of research

The type of research used is quasi-experimental with one group pretest posttest design. This design is carried out on one class selected randomly and no class stability test is carried out before being treated. This research design is shown in Figure 1.

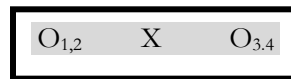


Figure 1. One group pretest posttest design

With:

O_{1,2} = initial test of creative thinking skills and writing literacy

O_{3,4} = final test of creative thinking skills and writing literacy

X = Lipro learning

The applied Lipro learning has received an assessment from learning model experts with a very feasible category. Lipro learning has a syntax as shown in Table 1.

TABLE 1 Lipro Learning Syntax

No.	Learning steps
1.	Orientation, apperception, and motivation
2.	Stimulation in the form of challenging questions
3.	Planning a project in the form of video story telling and writing articles (formulating problems, collecting data, and verification)
4.	Prepare a schedule of activities for making video story telling projects and writing articles
5.	Monitoring the progress of the project
6.	Product Rating
7.	Evaluation, reinforcement and feedback

The subjects in this study were one class consisting of 58 prospective physics teacher students. Lipro learning was applied to the Basic Literacy course in three meetings, namely two face-to-face meetings offline and one online. The first meeting offline was in the form of orientation activities, giving challenging questions, and problem solving. The second meeting was conducted online, namely project planning activities, scheduling, and monitoring the progress of the project. While the third meeting offline was in the form of product assessment and evaluation activities. Product assessment was carried out through product presentations and portfolio collection. Furthermore, project work was carried out outside of class hours.

Data Collection Instrument

The data collection instruments were in the form of initial and final learning product assessments. This assessment instruments were first validated by experts before being used. The validation results stated that the instruments were valid and suitable for use. In this study, the products assessed were video story telling and articles. Video story telling was assessed from the aspect of creative thinking skills while articles were assessed from the aspect of writing literacy skills. The creative thinking assessment indicators used in this study include fluency, flexibility, originality, and elaboration. The article writing assessment indicators used in this study include aspects of content, organization, vocabulary, language use, and mechanics. The criteria for assessing creative thinking skills and writing skills are shown in Table 2.

TABLE 2 Indicators for assessing creative thinking skills and writing literacy

Assessment indicators		
No.	Think creatively	Writing literacy
1.	Smoothness	Content
2.	Flexibility	Organization
3.	Originality	Vocabulary
4.	Description	Use of language
5.		Mechanics

The reliability of the assessment instrument was carried out using the test-retest-method. This method is carried out by taking two measurements on the same object. Furthermore, the results of the first and second measurements are correlated and the results show the reliability of the assessment instrument. The reliability coefficient for the creative thinking skills assessment instrument is 0.95. While the reliability coefficient for the writing literacy skills assessment instrument is 0.97. Therefore, it can be stated that both assessment instruments are reliable.

Data Analysis Techniques

Data analysis was conducted using quantitative descriptive, namely by comparing the scores of creative thinking skills and writing literacy of students before and after undergoing Lipro learning. The analysis was conducted using a paired sample T test, where this test was conducted by comparing the average of two variables for a single sample group. Before conducting a paired sample T test, the data was ensured to be normally distributed, namely by conducting a normality test through the Shapiro-Wilk test.

RESULTS AND DISCUSSION

Creative Thinking Skills

Before carrying out the learning, students make an introductory video in the form of students' initial knowledge about literacy. This is a product to assess students' initial creative thinking skills. Then, students apply Lipro learning according to the syntax shown in Table 1. After completing Lipro learning, students create a project in the form of a story telling video about solving literacy problems as a final assessment product of creative thinking skills. The results of the initial assessment and final assessment of students' creative thinking skills are shown in Table 3.

TABLE 3 Results of initial assessment of creative thinking skills

No.	Criteria for creative thinking	Early score	Final score
1.	Fluency	74	85.93
2.	Flexibility	69	81.83
3.	Originality	73	86.76
4.	Explanation	77	88.59
	Average	73.09	85.78

Based on Table 3, it can be seen that the average score of students' creative thinking skills increased after Lipro learning was implemented. The graph explaining the increase in students' creative thinking skills before and after Lipro learning was implemented is shown in Figure 2.

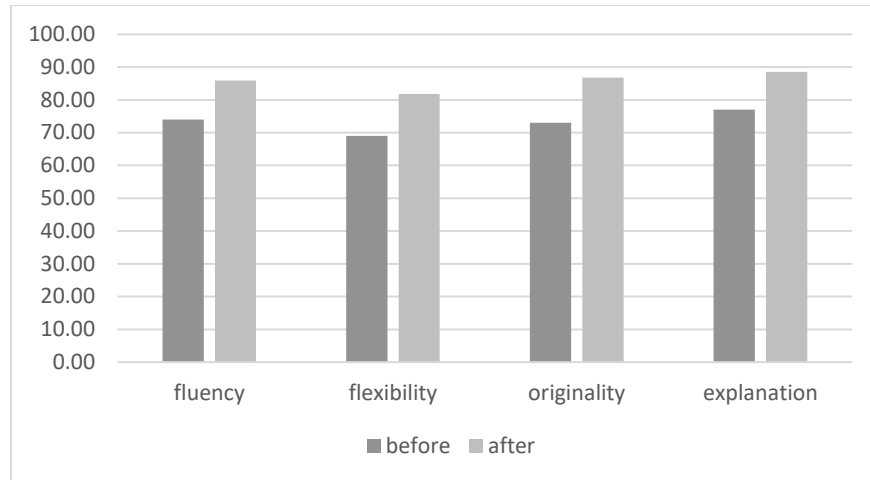


Figure 2. Graph of creative thinking skills before and after Lipro learning

The paired sample T-test on the data obtained was used to determine the significance of the increase in the initial and final assessment scores. Before conducting the paired sample T-test, the data was ensured to be normally distributed, namely tested for normality through the Shapiro-Wilk test. The results of the normality test through Shapiro-Wilk showed that the data were normally distributed. Thus, the data is worthy of a paired sample T-test. Furthermore, the results of the paired sample T-test on the creative thinking skills data are shown in Table 4.

TABLE 4 Paired Samples Test for Creative Thinking

		Paired Differences				T	Df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	pretest - posttest	-1.26897E1	1.23127	.16167	-13.01340	-12.36591	-78,489	57	.000

Based on Table 4. the results obtained sig. value (2 tailed) < 0.05 so that the final score experienced a significant increase compared to the initial score. Therefore, the application of Lipro learning can significantly improve students' creative thinking skills.

Writing Literacy

The initial assessment of writing literacy is in the form of an assessment of articles resulting from students' independent learning. This assessment is carried out before the implementation of Lipro learning. While the final assessment of writing literacy is in the form of an assessment of articles of students' real actions in solving problems that they have formulated during Lipro learning. The results of the initial and final assessments of students' writing literacy skills are shown in Table 5.

TABLE 5 Results of initial assessment of writing literacy skills

No	Writing literacy criteria	Early score	Final score
1	Content	75	85.90
2	Organization	68.9	84.45
3	Vocabulary	72.1	84.55
4	Use of Language	74	84.55
5	Mechanics	67.9	82.21
	Average	71.5	84.33

Table 5. shows that the results of the final assessment of students' writing literacy skills are higher than the initial assessment. This means that with the implementation of Lipro learning, students' writing literacy skills have increased. The graph of the increase in students' writing literacy skills is shown in Figure 3.

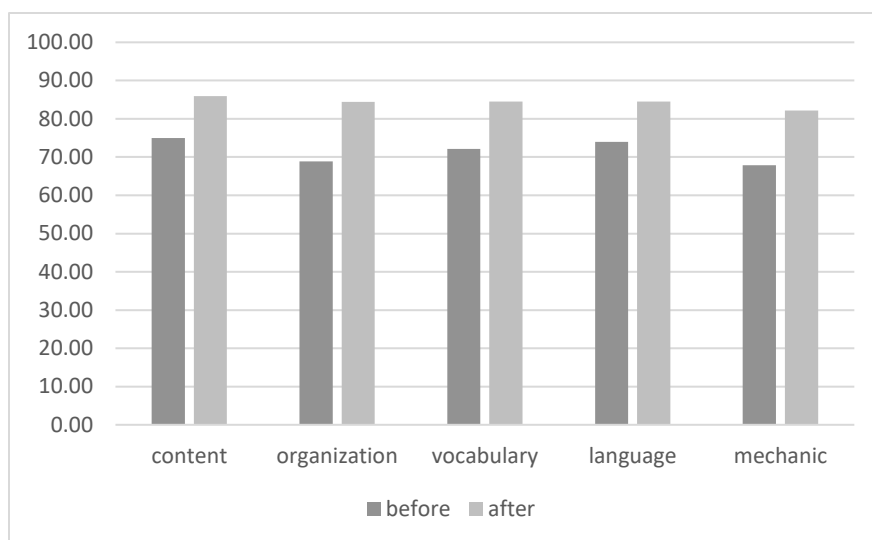


Figure 3. Graph of writing literacy skills before and after Lipro learning.

The significance of the increase in students' writing literacy skills was tested using a paired sample T-test. The results of the paired sample T-test on the writing literacy skills data are shown in Table 6.

TABLE 6 Paired Samples Test for Writing Skill

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pretest – posttest	-1.28276E1	1.60851	.21121	-13.25052	-12.40465	-60,735	57	.000

Based on Table 6. The results of the paired T-test, the sig. value (2 tailed) <0.05 was obtained so that the final score experienced a significant increase compared to the initial score. Thus, the application of Lipro learning can improve students' writing literacy skills.

DISCUSSION

The results of the study showed that students' creative thinking skills increased after implementing Lipro learning. This is because Lipro learning contains learning steps that can stimulate students' creative thinking. Learning steps that can stimulate students' creative thinking include stimulation in the form of challenging questions and project planning. The challenging questions given to students are how students can formulate steps to overcome the problem of low literacy among students. Through independent learning, using various references, collecting data at school, and brainstorming with colleagues, students can analyze problems and formulate various alternative solutions. Project planning is in the form of activities to formulate problems, collect data, and verify. In project planning activities, students plan products that will be made based on alternative problem-solving solutions that they have agreed upon with their group members. The solutions they formulate are then realized into video story telling products and articles. The video story telling that has been made is then presented in front of colleagues so that input can be provided for improvement. While the article is given input by the lecturer to obtain a good article. Thus, students' writing skills have also increased after Lipro learning.

The results of this study are in accordance with research that has been conducted by Putri et al. (2019) and Chrysti et al. (2018) which successfully proves that student creativity can be improved through project-based learning models. In addition, this study is also in accordance with the results of the study Suteja (2022) and Anggerani et al. (2022) which states that there is a significant difference in writing skills in students before and after using the project-based learning model. The results of this study have strengthened that the implementation of literacy learning integrated with Lipro project-based learning has been proven to further improve students' creative thinking skills and writing literacy abilities. In addition, in accordance with the opinion Wale and Bogale (2021), writing skills can also be improved by increasing the amount of writing practice students do and by providing them with feedback.

The obstacles faced in Lipro learning are that it takes a lot of time during learning. The most time is during problem-solving discussions, compiling scenarios, and making videos. Therefore, Lipro learning requires students to continue their projects outside of class hours. The ease of implementing Lipro learning today is that it can utilize existing technology, for example using video editing applications or artificial intelligence. In addition, by utilizing Google Docs, lecturers can easily and quickly provide input on student articles. Lipro learning can also be done in a blended way. Blended learning has been proven to increase literacy and provide opportunities for students to develop creativity (Kusnadi et al. 2023). By utilizing various technologies that exist today, Lipro learning is increasingly easy to implement and is expected to be more optimal in improving students' creative thinking skills and writing literacy.

CONCLUSION

Based on the results of the study, it can be concluded that the creative thinking skills and writing literacy of prospective Physics teacher students have increased after implementing Lipro learning. The creative thinking skills score increased from 73.09 to 85.78. The writing literacy skills score increased from 71.5 to 84.33. The results of the paired sample T test showed that the creative thinking skills and writing literacy of students before and after Lipro learning increased significantly. By utilizing various technologies available today, it is hoped that Lipro learning will be easier to implement and can be more optimal in improving students' creative thinking skills and writing literacy. Lipro learning can be done face-to-face offline or blended.

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