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PROBLEM-BASED LEARNING ASSISTED BY INTEGRATED LEARNING MEDIA BASED ON SOCIAL MEDIA TO IMPROVE STUDENTS' CRITICAL THINKING SKILLS

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ABSTRAK

SMAN 1 Besuki organizes education and learning that leads to 21st century skills. One of the 21st century skills developed is students' critical thinking skills. The critical thinking skills of class XI MIPA 1 students in the 2024/2025 Academic Year, especially in biology learning based on the results of interviews with biology subject teachers, still need to be improved, this is confirmed by the results of students' critical thinking ability tests with an average of 49.85 with a category still underdeveloped. The purpose of this study was to determine the role of Blended Problem Based Learning with integrated social media-based learning media in improving the critical thinking skills of class XI MIPA 1 students. This study is a Classroom Action Research based on Lesson Study. Data on critical thinking skills were obtained using a critical thinking test with essay-type questions. Data from students' critical thinking skills tests were analyzed descriptively qualitatively by referring to the Illinois Critical Thinking Essay Test. The results show that the results of students' critical thinking tests in cycle I and cycle II increased by 9.83%, which means that the critical thinking skills of class XI MIPA 1 students in the 2024/2025 Academic Year have developed well in biology learning using Blended-Problem Based Learning with integrated social media-based learning media.

Keywords:
Blended Learning, Critical Thinking, Integrated Social Media, Learning Media, Lesson Study, PBL

INTRODUCTION

SMAN 1 Besuki East Java has a bright vision in academic and non-academic achievements based on IMTAQ and science and technology in collaborating in the era of globalization. This vision is supported by the creation of learning by teaching staff that leads to the development of life skills for students in facing the challenges of the 21st century. Critical thinking, problem solving, creativity, communication, and collaboration are part of the components of 21st century competencies. (World Economic Forum, 2015). 21st century competencies are capital for students in facing complex life challenges.

Learning that aims to develop 21st century competencies is created by teaching staff at SMAN 1 Besuki in various subjects, one of which is biology. Based on the results of interviews with biology subject teachers who teach in classes XI MIPA 1 to XI MIPA 3 in the 2024/2025 Academic Year on August 6, 2024, information was obtained that one of the 21st century competencies in the spotlight is critical thinking

skills. Further observations were suggested by the biology subject teacher in XI MIPA 1. Based on the results of observations conducted on August 9-13, 2024, in class XI MIPA 1, several findings were obtained including students did not assess the credibility of information by using the teacher as the main learning source to explain the material. In addition, the information provided by the teacher was also not assessed by students either through responses or questions asked to the teacher.

Based on the observation results of students' critical thinking skills in class XI MIPA 1, further analysis was carried out by testing students' critical thinking skills. The Illinois Critical Thinking Essay Exam assessment rubric developed by Finken & Ennis (1993) was used to analyze the results of the critical thinking test. The results of the students' critical thinking test using essay questions from Basic Competence 3.3 of the biology subject for class XI obtained data from each component of critical thinking including: focus 51.25; supporting reasons 44.87; reasoning 46.45; organization 48.92; convention 52.76; and integration 54.85. The average critical thinking skills of class XI MIPA 1 students is 49.85. Critical thinking components if each is ≤ 50% indicate that the critical thinking skills indicator has not developed, conversely if the critical thinking component score is > 50% then the critical thinking skills indicator is developing well (Triyanto et al., 2016). Based on these indicators, the average value of students' critical thinking skills in class XI MIPA 1, if analyzed based on these indicators, is included in the category of still underdeveloped.

The less than optimal learning process is the cause of problems related to the lack of thinking skills in class XI MIPA 1. The use of learning resources that focus on the material provided by the teacher is an indicator that the learning process is less than optimal, especially learning conditions that do not support seem to force learning to be carried out by transferring information from teacher to student. Teachers predominantly explain material to students in lecture learning using various learning support media that minimize efforts to build knowledge in students' minds by utilizing various problems as learning stimuli (Triyanto et al., 2016).

The findings regarding the condition of critical thinking skills of XI MIPA 1 students must of course be a concern for biology teaching staff, including stakeholders at SMAN 1 Besuki. One of the important skills that must be developed as a goal of 21st century education is critical thinking (Bart, 2010; Moseley et al., 2005), to be competent in the global era because this is the most important characteristic of the 21st to 30th centuries (Alotaibi, 2013; Roekel, 2015). Considering the importance of critical thinking skills for students, biology teachers at SMAN 1 Besuki need to find effective learning in pursuing students' critical thinking skills.

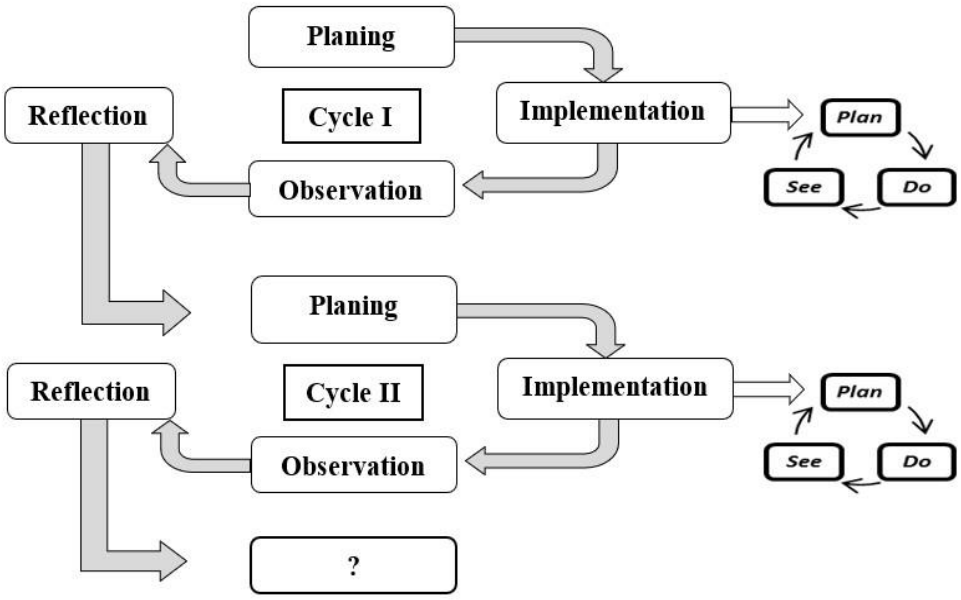
Learning that has not been able to overcome the less than optimal learning process, needs to be improved in the learning design used. Teachers in designing learning must be in line with the goal of maximizing the learning process so that it can be said that the learning is effective (Ginnis, 2008). Teachers need to strive for learning that facilitates the student learning process optimally. Blended-PBL accommodates a deep learning process for students because it uses a combination of the Blended Learning approach with the Problem Based Learning model (Triyanto et al., 2016). Blended-PBL is closely related to online learning because it utilizes technology (Donnelly, 2008). Blended-PBL makes it easy for students to find information online to facilitate student understanding, plus there are problems presented as stimuli for discussion between students (Jin et al., 2015). Blended-PBL has the power to develop students' critical thinking skills. The characteristics of Blended-PBL are supporters of these strengths; learning is stimulated by problems, the role of the facilitator is carried out by the teacher, problems are stimuli for learning, and there is group work. (Triyanto et al., 2016). Student learning is assisted by teachers so that they find control over the learning strategies used, such as utilizing learning media that can support communication between students, online communication between students and teachers, and is not limited by space and time (Gleadow et al., 2015; Kongchan, 2013).

Learning media that is not limited by time and can connect users online in online learning is very much needed in the era of progress like today. To support unlimited connectivity between students and teaching materials, teachers can utilize integrated social media. Integrated social media as an online learning media comes with the hope that communication messages can be spread widely and

meaningfully by using more than one social media that suits the characteristics of students. The integration between conventional media and new multimedia-based media has succeeded in conveying learning messages to be more meaningful because the weaknesses of one media can be covered by other media (Cangara, 2007; Putri, 2018). Social media that can be used is Instagram to convey information in the form of images or infographics, while information in the form of audio can be conveyed using Spotify. The process of media integration in learning requires research or study. Learning can be learned using Lesson Study with the principle of peers and collaborating in building a learning community. (Susilo, 2013). Triyanto & Prabowo (2020) saw that student learning outcomes in biology subjects can be improved by using Blended-PBL-based Lesson Study. Based on the condition that critical thinking skills are still underdeveloped in class XI MIPA 1 SMAN 1 Besuki in the 2024/2025 Academic Year in biology learning and seeing the potential of Blended-PBL based on Lesson Study and integrated social media-based learning media as research innovations, this research is important to be conducted to obtain the best quality learning while developing educator competence

Research METHOD

This Classroom Action Research is based on Lesson Study. The Classroom Action Research used includes several cycles, where each cycle consists of planning, implementation, observation, and reflection. The lesson study stage, namely planning, action, observation and reflection (Asyari et al., 2016; Susilo, 2013). Classroom Action Research is usually one cycle for one Basic Competency of the national curriculum in Indonesia. The long cycle condition makes Classroom Action Research weak in the design process because one design is used for that period of time. To improve the use of Classroom Action Research more optimally, Lesson Study activities are carried out in each implementation activity, so that further improvements can be made to the quality of learning. Classroom Action Research is not the same as Lesson Study, although both have the same goal, namely to improve the quality of learning. Classroom Action Research is research-based, while Lesson Study is not always research-based and has a wider scope than Classroom Action Research (Sriyati, 2014). The focus of lesson study is on improving the quality of learning and educator competence because it provides a process for educators to develop their professionalism and pedagogical abilities. (White & Lim, 2008). Figure 1 shows how lesson study-based Classroom Action Research is implemented



Gambar 1. Integration of Classroom Action Research with Lesson Study

Population and Sample

This research was conducted at SMAN 1 Kota Besuki, East Java Province. The subjects of the study were students of class XI MIPA 1 in the Odd Semester of the 2024/2025 Academic Year. There were 35 students, with 21 females and 14 males.

Instruments

Data collection techniques include test and non-test techniques. Test techniques are used to measure critical thinking skills with an essay test instrument. The critical thinking instrument was developed based on the Illinois Critical Thinking Essay Test previously developed by Finken & Ennis (1993) including: focus, supporting reasons, reasoning, organization, conventions, and integration which are the accumulation of all previous critical thinking indicators. The number of questions in the critical thinking instrument is five questions from Basic Competencies 3.4 and 4.4 of the XI grade biology subject, namely material on the relationship between cell structure in animal tissue and organ function in animals and five questions from Basic Competencies 3.5 and 4.5 of the XI grade biology subject is material on the structure of tissue that forms organs in the motor system related to bioprocesses and functional disorders that can occur in the human motor system. Each question in the critical thinking instrument used is also tested for validity and reliability to determine the quality of the instrument.

Non-test techniques used include observation and interviews. Interviews to find out initial information about biology learning at SMAN 1 Besuki, especially in class XI MIPA 1. Observations are used to determine the implementation of Blended-PBL in biology learning and the learning outcomes obtained in biology learning.

Procedure

This research was conducted in two cycles of Classroom Action Research with six Lesson Study activities from August to October 2024. The research procedure begins with conducting an initial analysis or pre-cycle, then determining problem solutions, developing learning designs using Blended-PBL, developing chapter designs and lesson designs that include sharing tasks and jumping tasks, developing biology learning media in the form of posters and podcasts packaged with integrated social media. All of these tools were developed together with the Lesson Study team.

Classroom Action Research based on Lesson Study theoretically has procedures in its implementation. Triyanto & Prabowo (2020) explain several stages of Classroom Action Research based on lesson study, including: 1) Planning, which is the process of identifying learning problems and determining solutions based on problem analysis; 2) Implementation, which is a follow-up to the problem analysis that has been carried out previously. Implementation of the action is also the implementation stage of the lesson study. The practice of Lesson Study in learning goes through several stages until the desired quality is achieved, these qualities include the quality of learning, the quality of learning outcomes, and the quality of educators (Susilo, 2013). Each stage of Lesson Study to achieve the desired quality consists of Planning, Implementation, and Review.

The Lesson Study process in Japan has three basic stages. The first stage includes activities such as problem identification, lesson planning, learning implementation, evaluation, and reflection. The results of the evaluation and reflection from the first stage are used as the basis for planning the next lesson. The second stage includes planning learning outcomes from the evaluation and reflection of the previous meeting, the implementation of suggested learning, evaluation, and reflection. The last stage is publishing the results. (Baba, 2007; Stigler & Hiebert, 2000). Educators at all stages of Lesson Study work together with the Lesson Study team to plan, design, implement, evaluate, and improve learning (White & Lim, 2008); 3) Observation: The observation stage is carried out to find out a comprehensive description of the implementation phase of action research; 4) Reflection: The reflection stage includes activities to analyze the process and impact of the implementation of the action, all data collected is evaluated to be used as a basis for planning for the next cycle.

The detailed procedures of the Lesson Study-based Classroom Action Research carried out are as follows:

1. Planning

The critical thinking skills of class XI MIPA 1 in the 2024/2025 Academic Year analyzed using the Illinois Critical Thinking Essay Test had an average score of 49.85 or fell into the category of underdeveloped in biology learning. Based on this condition, Blended-PBL based on Lesson Study and integrated social media-based learning media were chosen as a solution to improve students' critical thinking skills and educator competence.

The planning stage consists of several activities carried out together with the Lesson Study team. The Lesson Study team consists of leadership elements and subject teachers. The involvement of leadership elements from school institutions is very important in the implementation of Lesson Study because it can be used by school leaders to carry out academic supervision of teachers in developing their competence continuously without having to leave school so that it has a significant impact on improving teacher performance and learning quality. The Lesson Study team here also involves biology subject teachers. The Lesson Study Team created a design chapter and lesson design for each of the two meetings in Cycle I of Classroom Action Research from Basic Competencies 3.4 and 4.4 for biology subjects of grade XI high school, namely material on the relationship between cell structure in animal tissue and organ function in animals. In addition, the Lesson Study Team also created a design chapter and lesson design for each of the two meetings in Cycle II of Classroom Action Research from Basic Competencies 3.5 and 4.5 for biology subjects in grade XI high school, namely material on the structure of tissues that form organs in the motor system related to bioprocesses and functional disorders that can occur in the human motor system. Each lesson design is always equipped with sharing tasks and jumping tasks to develop students' high-level thinking skills. The lesson design is also equipped with Student Worksheets to support the student-centered learning process

The team also developed a critical thinking instrument adapted from the Illinois Critical Thinking Essay Test previously developed by Finken & Ennis (1993) including: focus, supporting reasons, reasoning, organization, conventions, and integration. The critical thinking instrument consists of ten (10) essay questions divided into five (5) questions for Basic Competencies 3.4 and 4.4 and five (5) questions for Basic Competencies 3.5 and 4.5 for grade XI high school biology. In addition, the Lesson Study team also developed an observation sheet on the implementation of learning with the Blended-PBL model and a learning observation sheet that focuses on student learning activities. The planning stage also prepares social media used to support the implementation of learning. The social media used are Instagram and Spotify. Both social media are used to upload teaching materials that students will study later in learning. Instagram is used to convey information or teaching materials in the form of images or infographics, while Spotify is used to convey information or teaching materials in audio form.

2. Implementation

The research planning stage that has been carried out with the Lesson Study team for further implementation. This action research was carried out in two cycles, where each cycle was carried out to achieve learning objectives in one Basic Competency. Basic Competencies 3.4 and 4.4 of the biology subject for grade XI high school for Cycle I while Basic Competencies 3.5 and 4.5 of the biology subject for grade XI high school for Cycle II. Each Basic Competency is taken through two face-to-face or virtual meetings. Each learning activity is planned, implemented, and reflected on through Lesson Study activities. So, in this action research, each cycle of action research is carried out twice with Lesson Study activities.

The learning design that has been developed by the Lesson Study team is then applied in learning activities for meetings one and two in Cycle I and meetings three and four in Cycle II. The learning design applied in learning uses the Blended-PBL learning model by utilizing integrated social media, namely Instagram and Spotify. The first meeting in Cycle I discussed the main material regarding the structure of cells in animal tissue and the function of internal organs in animals. In addition, the second meeting in Cycle I discussed the main material, namely the relationship between cell structure in animal tissue and organ function that he compiled using data from observations and studies through

textbooks and teaching materials uploaded on Instagram and audio recordings on Spotify. After the first and second meetings were completed, assessment activities to measure students' critical thinking skills in Basic Competencies 3.4 and 4.4 in the subject of biology for grade XI were carried out.

Cycle II consists of the third and fourth meetings. The third meeting discusses the material on the relationship between the structure of organ tissue and bioprocesses in the human motor system. The fourth meeting discusses the material on the relationship between the structure of organ tissue and functional disorders in the human motor system and technology to overcome disorders in the human motor system. Teaching materials in the form of images and infographics are uploaded on Instagram, while teaching materials in the form of audio are uploaded on Spotify. After the third and fourth meetings are completed, assessment activities to measure students' critical thinking skills in Basic Competencies 3.5 and 4.5 of the 11th grade biology subject are carried out.

3. Observation

Observation in action research is carried out to capture the entire course of research from Cycle I to Cycle II. To distinguish observation in action research from the viewing stage in Lesson Study activities, it can be seen in the focus of observation. Observation in Lesson Study activities takes more pictures of student learning activities in learning made by the teacher, while observation from action research takes pictures of the general course of research. So, observation from action research can utilize the results of observations of student learning activities in learning made through Lesson Study activities, while observation in Lesson Study activities cannot be independently stated as the results of action research observations.

Observation activities are carried out together with the Lesson Study team, which consists of five observers. Each observer in carrying out action research observations uses the Blended-PBL implementation observation sheet and the student learning activity observation sheet in learning made by the teacher. One example of the focus of observation in the implementation of Blended-PBL is the use of authentic problems that are successful as learning stimuli. In addition, the results of observation activities in action research are used as a basis for developing corrective actions after going through the analysis process at the reflection stage.

3. Reflection

The reflection stage in action research starts from the results of the analysis of the process and effects of implementing the action. The action referred to here is the application of Blended-PBL based on integrated social media in seeking critical thinking skills for class XI MIPA 1 students of SMAN 1 Besuki in the 2024/2025 Academic Year in biology learning. The results of the analysis in the form of strengths, weaknesses, or obstacles in implementing the action in Cycle I are used as a basis for compiling an action plan in the Cycle II stage and so on until the research objectives are achieved.

Data Analysis Techniques

The critical thinking skills data consisted of students' critical thinking skills scores and scores for each critical thinking component including focus, supporting reasons, reasoning, organization, conventions, and integration obtained from the critical thinking skills test. The results of the critical thinking test were then assessed using the critical thinking rubric from the Illinois Critical Thinking Essay Test developed by Finken & Ennis (1993).

The assessment procedure, namely: 1) the maximum score ranges from 6 to 36; 2) a score of 1-3 indicates that the critical thinking component being assessed is not visible or is at a stage that is still underdeveloped and a score of 4-6 indicates that the critical thinking component is very well developed; 3) each component is assessed separately except for the integration component. There are five critical thinking questions from each cycle. Each critical thinking question is assessed with a critical thinking rubric that includes focus, supporting reasons, reasoning, organization, and conventions, while the score for integration is obtained from the average score of the other components. The value of students'

critical thinking skills is obtained from the sum of all scores obtained from each component divided by the maximum score. The maximum score for critical thinking is 180 if there are 5 questions, obtained from 6 times 30. A score of 30 is obtained from the maximum score for the critical thinking rubric multiplied by 5 question items. The increase in critical thinking scores is obtained from the average critical thinking score in Cycle II minus the average critical thinking score in Cycle I divided by the average critical thinking score in Cycle I multiplied by 100%

The value of each critical thinking component is obtained from the total score of each critical thinking component from 5 question items multiplied by 35 students divided by the maximum score of each critical thinking component, which is 1050. The maximum score for critical thinking is obtained from the maximum score of each aspect multiplied by 5 question items multiplied again by 35 students.

The results of both students' critical thinking skills scores and the scores of each critical thinking component are categorized into two categories, namely "still underdeveloped" if the score is 50 and "well developed" if the score is >50. (Triyanto et al., 2016)

RESULTS AND DISCUSSION

Results of Instrument Validity and Reliability Test

The research data were obtained using instruments that had previously been tested for validity and reliability. The trial was conducted on the Basic Competency Test instrument in cycle I and cycle II. The critical thinking skills instrument in the form of essay questions, 10 essay questions based on the content and construction validity test stated that all items were valid. The reliability test was used to measure the level of consistency of respondents' answers to the item questions. The results of the calculation of the reliability coefficient stated that each question item for the critical thinking test in biology learning provided consistent or reliable results. The results of the critical thinking instrument test for the first cycle questions obtained a Cronbach Alpha value of 0.954 while for the second cycle questions it was 0.976. These items were declared reliable because the Cronbach's Alpha value> r-table (0.349) at a significance level of 5%.

Students' Critical Thinking Skills

Data on critical thinking skills were obtained through critical thinking tests. The critical thinking skills test was conducted at the end of Cycle I and Cycle II. The analysis was carried out by calculating the critical thinking component scores obtained by each student of class XI MIPA 1, then the data was used to determine the critical thinking component scores of each student classically. The critical thinking score in class XI MIPA 1 was classically obtained from the sum of all critical thinking component scores. The critical thinking component scores of class XI MIPA 1 students from Cycle I and Cycle II can be seen in Table 1

Tabel 1

Critical thinking component scores for students in cycle 1 and cycle II

No	Critical thinking components	Nilai		Peningkatan (%)
		Siklus I	Siklus II	
1	Focus	56.75	62.22	9.64
2	Supporting reasons	48.28	52.96	9.69
3	Reasoning	49.35	53.45	8.31
4	Organization	53.82	58.45	8.60
5	Convention	56.53	62.54	10.63
6	Integration	58.64	11.78	11.78

Based on Table 1, all critical thinking component scores of class XI MIPA 1 students in cycle I for the Supporting Reasons and Reasoning components are in the category of not developing well, while the Focus, Organization, Convention, and Integration components are already in the category of

developing well. All critical thinking components in cycle II are included in the category of developing well. The highest increase in critical thinking component scores was owned by integration 11.78%, convention 10.63%, supporting reasons 9.69%, focus 9.64%, organization 8.60%, and reasoning 8.31%.

Critical thinking scores in class XI MIPA 1 classically increased from cycle I to cycle II. The average critical thinking skill score for class XI MIPA 1 students in the first cycle was 53.91, which means that the average critical thinking skills of class XI MIPA 1 students have developed well and in the second cycle it was 59.21, which means that the average critical thinking skills of class XI MIPA 1 students have developed well. good. The percentage increase in critical thinking skills of class XI MIPA 1 students reached 9.83% as shown in Table 2..

Tabel 2

Critical thinking values for class XI MIPA 1

No	Deskripsi	Nilai		Improvement (%)
		Siklus I	Siklus II	
1	The average value of students' critical thinking skills	53.91	59.21	9.83

Critical thinking skills data were analyzed using the Illinois Critical Thinking Essay Test and the Illinois Critical Thinking Essay Test Assessment Guidelines by Finken & Ennis (1993). The critical thinking skills scores of grade XI MIPA 1 students increased after studying with Lesson Study-based Blended-PBL. The critical thinking skills scores of grade XI MIPA 1 students have increased from Cycle I to Cycle II.

Students' critical thinking skills can be improved through the application of Lesson Study-based Blended-PBL in learning. These results are in accordance with research conducted by Sendag & Odabas (2009) that online-PBL has a significant influence in improving critical thinking skills. Critical thinking is included in High-Order Thinking Skills. (Page & Mukherjee, 2006; Sendag & Odabasi, 2009). Alias & Saleh (2007) and Ibrahim et al., (2015) stated that Blended-PBL is effective in developing High-Order Thinking Skills (HOTS), including critical thinking.

The implementation of Blended-PBL based on Lesson Study improves students' critical thinking skills classically from Cycle I to Cycle II, including components of focus, supporting reasons, reasons, organization, conventions, and integration. The focus component shows the level of truth and clarity of the main ideas that students have (Finken & Ennis, 1993), when solving problems or tasks. Blended-PBL uses PBL as the main pedagogical model (Donnelly, 2006), where PBL has a syntax that directs students to analyze problems, describe systematic explanations of problem analysis, and formulate learning objectives based on problem analysis (Schmidt, 1983; Wood, 2003; Yu et al., 2015) so that the focus component can be developed. Problems in learning require students to use their critical thinking skills. (Sendag & Odabasi, 2009).

The supporting reason component of critical thinking skills has also increased through the implementation of Blended-PBL. Supporting reasons indicate the level of truth, clarity, reliability, credibility, of supporting reasons or reference sources (Finken & Ennis, 1993) in solving problems or tasks. The level of truth, clarity, reliability, and credibility of problem-solving results can be tested by students in the learning process. Blended-PBL provides a learning environment that facilitates these activities, at the stage where students collect information in groups and test the results of group discussions in class discussion forums. (Lukitasari et al., 2019; Schmidt, 1983; Wood, 2003; Yu et al., 2015).

The reasoning component of critical thinking skills has also increased through the implementation of Blended-PBL. Reasoning indicates the level of truth and clarity of conclusions supported by reasons or evidence, alternative solutions, and arguments (Finken & Ennis, 1993) from problems or tasks. Blended-PBL provides a learning environment for students to develop reasoning components through the stages of concluding and seeking additional information, as evidence or

alternative solutions to the problems faced. Students can transfer the concepts they learn through online discussions into real discussions in class to solve problems (Sendag & Odabasi, 2009), through Blended-PBL.

The organizational component of critical thinking skills has also increased through the implementation of Blended-PBL. Organization, shows the level of clarity and interconnectedness between logically interconnected answers (Finken & Ennis, 1993) of the problem or task being solved. Problem-based learning in online PBL or Blended-PBL encourages students to think more deeply (Sendag & Odabasi, 2009) so that the problems or tasks being solved become clear and logically interconnected.

The components of convention and integration of critical thinking skills have been improved through the implementation of Blended-PBL. Convention indicates the use of grammar, while integration indicates a general evaluation of the clarity of problem solving that has been done. (Finken & Ennis, 1993). Students in Blended-PBL are trained to use good and correct grammar by providing learning steps that facilitate students to present in class discussion forums, ask questions, and give opinions. Blended-PBL or online-PBL facilitates students to think reflectively (Sendag & Odabasi, 2009) through closing activities. The average value of critical thinking skills of class XI MIPA 1 students generally increased from Cycle I to Cycle II with the implementation of Blended-PBL. The implementation of Blended-PBL can train students to develop their critical thinking skills. (Lukitasari et al., 2019). One of the improvements that occurred was influenced by the role of the teacher as a facilitator in learning. The teacher in online PBL learning acts as a facilitator. (Donnelly, 2006). Teachers who provide discussion guides encourage students to think deeper, discuss more, think further, and do more research so that students' critical thinking skills can develop. (Sendag & Odabasi, 2009).

Blended-PBL supports flexible learning. Blended-PBL facilitates students to learn using media that is not limited to online. (Gleadow et al., 2015; Kongchan, 2013). Learning media packaged with integrated social media is one definition of unlimited media use. Utilizing social media by uploading or posting on social media is an effective way to trigger students' critical thinking skills. (Pattanapichet & Wichadee, 2015). The use of integrated social media in delivering learning materials using various social media in the form of uploading images, sounds, or even videos aims to improve the quality of meaning of communication between students and teaching materials, students and students, and even students and teachers. The use of technology and the use of social media in learning is a positive way to encourage students to think critically and reflectively. (Bailey, 2014).

The teacher as a facilitator in learning together with the Lesson Study team reflects on the implementation of learning at each meeting in Cycle I and Cycle II to improve students' critical thinking skills. Reflection activities in Lesson Study are carried out to identify problems that occur in learning. (Baba, 2007). An example of the results of problem identification that was successfully implemented and improved the quality of the learning process is the use of learning media that is not limited to PowerPoint but also involves video and flash animation in learning through Blended-PBL. The combination of PBL and technology in learning improves the quality of students' learning experiences. (Lukitasari et al., 2019).

One of the results of the see stage in Lesson Study is to provide opportunities and encourage students to ask questions in learning. The opportunities and encouragement given by teachers to students are the results of Lesson Study. Lesson Study is a meaningful way to reflect and ask critical questions about learning. (Trapero, 2013). The results of Lesson Study activities encourage students to have critical thinking characteristics. Students who think critically have several characteristics, including asking the right questions to clarify understanding and trying to be knowledgeable. (Ennis, 1993).

CONCLUSION

Based on the results of students' critical thinking tests in cycle I and cycle II, there was an increase of 9.83%, which means that the critical thinking skills of class XI MIPA 1 students have developed well in biology learning using Blended-PBL with integrated social media-based learning media. Based on Lesson Study Blended-PBL plays a role in improving students' critical thinking skills by utilizing learning

media packaged through integrated social media because the communication formed is more meaningful.

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