

Assessment of Students' Creative Thinking Skill on the Implementation of Project-Based Learning

Eka Dyah Puspita Sari

Jenderal Soedirman University, Indonesia
Email: eka.dyah@unsoed.ac.id

Ririn Kurnia Trisnawati

Jenderal Soedirman University, Indonesia
Email: ririn.trisnawati@unsoed.ac.id

Mia Fitria Agustina

Jenderal Soedirman University, Indonesia
Email: mia.agustina@unsoed.ac.id

Dian Adiarti

Jenderal Soedirman University, Indonesia
Email: dian.adiarti@unsoed.ac.id

Najib Noorashid

Universiti Brunei Darussalam, Brunei Darussalam
Email: najib.noorashid@ubd.edu.bn

Received: 02 November 2022

Reviewed: 1 May 2023-28 September 2023

Accepted: 29 September 2023

Published: 30 September 2023

Abstract

The implementation of *Merdeka Belajar – Kampus Merdeka* (Freedom to Learn) in Indonesia urges universities to adapt and set changes in learning activities. One of the changes is the implementation of Project-Based Learning to increase students' activeness and creativity. This research aims to assess students' creative thinking skills on the implementation of Project-Based Learning. This research is a descriptive qualitative case study. Purposive sampling is chosen in this research because the sample is chosen on purpose, i.e., those who join literary criticism class. There are thirty-six students who played as the subject of the research. It uses observation sheets and questionnaires to obtain the data. The data are then analyzed to get reliable results of students' creative thinking assessment. The result shows that half of the students (50%) agree that they face some difficulties in developing their creative thinking. Most of their problems are developing ideas into coherence text, structuring or organizing a good text, and choosing appropriate vocabulary to avoid repetition in the text. Students also find that project-based learning allows them to develop their creative thinking. It can be seen from four main rubrics of creative thinking assessment in forms of originality, fluency, flexibility, and elaboration. Regarding the result, it can be

concluded that project-based learning is proven to be beneficial in developing students' creative thinking skills, though they find some obstacles during the process.

Keywords: Case study; learning assessment; project-based learning; students' creative thinking; teaching method

Introduction

The Government urges universities to adapt with the demand of globalization. It was used as the basis of *Merdeka Belajar – Kampus Merdeka/MBKM* (Freedom to Learn) program set by the Government. The program aims to maximize students' ability to meet learning outcome and to master additional skill through learning experience gained in the campus and outside the campus (Wulandari et al., 2020). There are four important programs on Freedom to Learn. They are automatic re-accreditation for study program, students' rights to study for three semesters outside their study programs, autonomy to establish study programs for qualified universities, and freedom for state universities to become legal corporation. These four programs are aimed to give freedom for institutions to be more autonomous, independent, less bureaucratic, and innovative (Fitriati, 2015). This practice also lets students learn autonomously to excel and expose their own ability along with their passion. The more learning experience the students gain from the Freedom to Learn program, the steadier the students are to face the real-world life. It is in line with Yuliana's opinion. She highlights the importance of critical thinking and creativity as important skills during Freedom to Learn program. Hence, she also notes that the implementation of the program can be a challenge not only for the students, but also for the teachers/lecturers and the institution itself (Yuliana, 2021). The implementation of Freedom to Learn program causes some changes in learning process. The changes are overtly stated in *Indikator Kinerja Utama/IKU* (Key Performance Indicator). There are eight indicators listed on Key Performance Indicator. One of them relates to increasing quality of curriculum and learning process.

Curriculum and learning process are two important points when it comes to the education field. They make sure all students exposed to same materials and to maintain the quality of education in Indonesia, so the students are expected to have similar competence and performance in the same education level. Tedesco, Renato, and Massimo (2013) also highlight the importance of curriculum by stating "Instead of being viewed simply as a collection of study plans, syllabi and teaching subjects, the curriculum becomes the outcome of a process reflecting a political and societal agreement about the what, why, and how of education for the desired society of the future" (Carlos Tedesco & Operti Massimo Amadio, 2013). It can be seen that curriculum is not only a set of methods and lesson plans for teaching, but it also works as the guidance in producing output of the education. Increasing the quality of curriculum surely increases the quality of both education and students in academic and real world lives.

One of the ways to increase the quality of curriculum and learning process is by implementing case-based and project-based learning as methods in teaching learning process. The implementation of case-based and project-based learnings is overtly written on *Indikator Kinerja Utama/IKU* (Key Performance Indicator) number 7 which states "The use of case method learning or project-based learning as one of evaluation components" (Wulandari et al., 2021). When the Government puts the two teaching methods as one of the key performance indicators, it shows that both case-based and project-based learning play crucial role in national education. Both teaching methods can increase the quality of learning process and can promote students' creative learning in the same time by utilizing students' higher order thinking skills. Case-based learning helps students comprehend and solve real problem or situation similar to the real one in the future, while

project-based learning engages students to work on a project using their creativity (Savery, 2006). The definition of project-based learning is in line with Pearlman and Thomas who state project-based learning as “a model that organizes learning around projects” (Thomas, 2000). Both methods make students the center of the class and actively engage in each step during the learning process.

This research puts its focus on the implementation of project-based learning because project-based learning aims to increase students’ activeness and creativity with project as the output. It lets students not only learn about the content of the learning, but also learn about the skills in producing the output. When students make a project as the output, they are going to implement some soft skills in the process, such as communication and time management skills. Moreover, in making the project, students also adapt with the development of information technology to support their process in making the project. These creative skills are not overtly taught in the classroom; rather the students gain them in the process of making the output. Project-based learning also allows students to be responsible and develop their own ideas into real in the form of projects. The project is not only limited to a real object, but it can also be in the form of writing, skill, magazine, and even journal articles.

There are some previous researches focused on project-based learning. First research was conducted by Indrawan, et. al. (2018) which put their focus on the review of the implementation of project-based learning. The result of their research highlighted the learning process through project-based learning method. Students’ response came out as “students will work within a team, find the skills to plan, organize, negotiate, and make a consensus about issues of tasks that will be done” (Indrawan et al., 2019). This showed good practice of project-based learning. Another research was conducted by Maulany. She put her focus on the implementation of project-based learning in teaching speaking. The result of her research showed that project-based learning had a good impact on students’ speaking skill in comprehension, vocabulary, grammar, fluency, and pronunciation (Maulany, 2013). The results from both previous studies expose the advantage of implementing project-based learning as a teaching method. However, none of the previous studies touches the students’ creative thinking skill. Indeed, students’ creative thinking skill is one of the highlighted skills when it comes to project-based learning activity. Regarding the gap with the previous researches, a question comes up as “How can lecturers assess students’ creative thinking skill on the implementation of project-based learning?” The question leads to the aim of this research as to assess students’ creative thinking skill on the implementation of Project-Based Learning.

Literature review

Previous studies

There are some studies conducted previously related to project-based learning topics. The first research is “The Project-based Assessment Learning Model that Impacts Learning Achievement and Nationalism Attitudes” (Widiana et al., 2021). This research puts its focus on the effectiveness of the project-based assessment with the orientation of national insight. The result of the research shows that project-based assessment gives a positive effect on students’ learning achievement and nationalism attitudes. Another research is also conducted on this topic. It is “Assessing Students’ Learning in Project-based Learning Approach” (Fitriati, 2015). Fitriati puts her focus on finding new assessment methods in project-based learning. The result of Fitriati’s research is that sustained project-based learning comes up as a new assessment method, though its implementation is not an easy job to do. Another previous research related to the topic is “Implementing Project-based Learning and E-Portfolio Assessment in an Undergraduate Course”

(Gülbahar & Tinmaz, 2006). The research aims to implement project-based learning by utilizing e-portfolio assessment in the classroom. The result of the research shows that e-portfolio assessment in project-based learning is proven to be helpful in the learning process. All those previous studies put their focus on the use of project-based learning in the teaching learning process. But, none of them highlights the development of students' creative thinking during the process. Hence, this research comes up to fill the gap by focusing on the assessment of students' creative thinking with the title "Assessment of Students' Creative Thinking on Project-Based Learning".

Teaching method

In conducting a successful teaching learning activity, a teacher/lecturer needs to master appropriate teaching methods. Al-Rawi defines teaching method as "the mechanism that is used by the teacher to organize and implement a number of educational means and activities to achieve certain goals" (Al-rawi, 2013). Various teaching methods have been introduced by scholars, especially in teaching English. Aznar (2014) elaborates English teaching method as the Grammar-Translation Method (GTM), the Direct Method (DM), the Audio-Lingual Method (ALM), Total Physical Response (TPR), Communicative Language Teaching (CLT), Task-based Language Learning (TLL), and Suggestopedia. The Grammar-Translation Method (GTM) is the oldest English teaching method. It deals with learning English grammar rules and vocabulary with the main objective "students become able to translate from one language to another" (Aznar, 2014). The Direct Method (DM) focuses on equipping students to use English to communicate. But it is quite difficult in practice because the structure of the native language is different from the English structure. The Audio-Lingual Method (ALM) deals with repetition and habit formation, in which it relates to listening and oral production, not merely studies writing and reading. Total Physical Response (TPR) refers to learning in accordance with the action and speech at the same time. Aznar (2014) defines TPR as "learning the language through physical and motor activity" (Aznar, 2014). Communicative Language Teaching (CLT) is a transition of teaching into students-centered learning. It puts its focus on "helping students to create meaning as opposed to helping them to acquire precise grammatical structures or acquire a level similar to that of a native" (Aznar, 2014). Task-based Language Learning (TLL) trains students by giving out some activities to help them learn English. Suggestopedia mixes the use of comfortable and relaxing music, environment, and students-teacher relationship to make students feel relaxed in learning English. Knowing the difference and significance of each teaching method is going to give teachers/lecturers broader views and can let them choose the most appropriate and suitable method in the teaching learning process.

Project-based learning

Project-based learning is one of teaching methods in promoting output-based education. Project-based learning in nature lets students work on their own performance and creates a project as their learning output. Project-based learning can be defined as "a teaching method in which students work on a project over an extended period of time (from a week up to a semester) that engages them in solving a real-world problem or answering a complex question" (Bytyqi, 2021). Thomas (2000) adds more by stating "the project-based learning is a teaching model that puts emphasis on assigning tasks, particularly in the form of projects that can lead students to experience an inquiry process" (Hamidah et al., 2020). Regarding those definitions, it can be concluded that project-based learning is a teaching method that explores more on students'

individual performance through doing projects as the task. It is quite a different practice to those previous teaching methods. They put teachers as the main center of the learning process. But, project-based learning puts students as the subject and focus. Putting students as the main focus of the learning process lets students explore more of their competence while exposing their performance. This kind of practice is expected to excel students' competence and achieve learning objectives at its maximum.

Conducting project-based learning as a teaching method in class surely exposes some advantages and challenges for both teachers/lecturers and students. Harmer et. al. (2014) elaborate some advantages of project-based learning as "improved academic achievement, development of wider skills such as teamwork/collaboration, problem solving skills, subject knowledge, etc., increased students motivation and enjoyment, enhanced outreach and engagement beyond academics" (Harmer et al., 2014). With various advantages offered by project-based learning, implementing it is not an easy task. It comes with some challenges that teachers/lecturers need to consider. According to Harmer et. al. (2014), there are two main challenges in project-based learning. First, teachers/lecturers play the new role of facilitator. Second, it takes much time and resources for implementing project-based learning compared to conventional teaching methods. These two challenges should be put on consideration when teachers/lecturers want to implement project-based learning, besides deciding what project needs to choose to meet the learning objective.

Conducting project-based learning can be in various forms, not only limited to a single project. It can be in forms of research projects, construction projects, and even real-world projects. Knowing the range of projects listed on project-based learning lets teachers/lecturers find the most suitable outcome of their teaching learning process. It also helps them to set appropriate assessment for the learning process.

Learning assessment

Last step in teaching is evaluating the learning process. One great way to evaluate the process is by conducting an assessment. Assessment is vital when it comes to evaluation of the learning process. It helps teachers/lecturers know the level of students' comprehension of a topic. By knowing the students' comprehension, teachers/lecturers can figure out whether their materials are delivered well to the students or not. Assessment of learning can be defined as "strategies designed to confirm what students know, demonstrate whether or not they have met curriculum outcomes or the goals of their individualized programs, or to certify proficiency and make decisions about students' future programs or placements" (Earl, 2006). This definition is in line with the opinion which states "all activities that teachers and students undertake to get information that can be used to alter teaching learning" (Tekyiwa Amua-Sekyi, 2016). Those definitions of learning assessment show that learning assessment is essential in the teaching learning process. It does not only let teachers/lecturers measure students' comprehension, but also let students give feedback to teaching methods during the learning process. Conducting learning assessment does not solely put on teachers/lecturers' needs. It should consider some things, such as the reason why teachers/lecturers are assessing, what topics are going to be assessed, and what kinds of assessments are going to be implemented.

There are two kinds of assessment, i.e., formative and summative assessments. Formative assessment deals with assessment for learning, in which it occurs when teachers/lecturers base their instruction on assumptions about students' progress, while summative assessment deals with assessment of learning, in which it happens when teachers/lecturers assess students' performance

in relation to objectives and standards using proof of their learning (Masrur et al., 2016). Most of the time in formal education, summative assessment is more preferable to use since it is scheduled periodically, such as in mid-term, and typically evaluates the students' learning to others and to the grade level criterion-standard. Summative assessments are conducted to evaluate a wide range of students' performance, such as the process of students' learning, skill acquired by the students, and students' academic achievement in forms of numbers. Criterion standards set by the Government slightly evaluate students' skill acquisition, since it is somehow abstract and subjective to assess. But, conducting assessment on skill acquisition is vital to increase students' soft skills.

Students' creative thinking

Creativity is one factor that makes one person different with others. There are three benefits of having creativity in the future, as people compete each other in the future global market, information and communication technology development makes production cycle short, and automatized jobs do not need creativity in the process (Kanli, 2021). In education field, creativity plays a crucial role for both teachers and students. Creativity in teachers lets them be creative with method of teaching to help them deliver the material well. Creativity in students let them be creative with method of learning to help them understand and comprehend the material well. It can be seen that creativity plays equally important in teaching learning activity. It can also lead to increase students' creative thinking. Kamyli and Berki, in O'Sullivan, define creative thinking as "the thinking that enables students to apply their imagination to generating ideas, questions and hypotheses, experimenting with alternatives and to evaluating their own and their peers' ideas, final products and processes" (O'Sullivan, 2021). Using one's imagination to generate ideas can make up new and effective way to solve problem faced by students during teaching learning activity. Boswell and Carlile (2011) are in line with this statement by stating "creative thinking encourages students to use a variety of approaches to solve problems, analyze multiple viewpoints, adapt ideas, and arrive at new solutions" (Boswell & Carlile, 2011). In other words, it can be stated that creative thinking is fruitful for students in learning and comprehending material.

In creative thinking, there are some factors involved. They are finding and solving problems, selective information that is relevant to problem, evaluating ideas, associative thinking, flexibility and divergent thinking. When it comes to assessment, creative thinking relies mostly on divergent thinking. O'Sullivan further explains divergent thinking as "a thought process used to generate creative ideas via searching for many possible solutions" (O'Sullivan, 2021). Kalargiros and Manning support the definition by stating "divergent thinking is the critical process that initiates, energizes, and permeates all stages of creativity and innovation and is necessary for change" (Kalargiros & Manning, 2015). It can be seen that assessing creative thinking by divergent thinking is fruitful since it employs all stages to make students more creative and innovative. O'Sullivan elaborates the creative thinking assessment rubric by four big concepts. They are originality, fluency, flexibility, and elaboration. Originality deals with original and unique ideas of students' responses to a specific problem. Fluency relates with the number of students' responses to a specific problem. Flexibility holds the number and uniqueness of students' specific responses to a specific problem. Elaboration is to provide detailed information of students' responses to a specific problem. (O'Sullivan, 2021). Those four concepts in creative thinking assessment are going to create good learning experience and practice for students if they are applied well in the learning process.

Research method

Research design

This research was a case study, in which it studied students' creative thinking. Yin (1994: 13), in (Rhee, 2004), defines case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident ... [and] relies on multiple sources of evidence" (Rhee, 2004). Regarding the definition, the main reason for choosing case study as the research design was that this research analyzed and described students' creative thinking skill in its real-life context, i.e., during the teaching learning process. It was strengthened with the definition that stated "A descriptive study focuses on covering the background information and accurate description of the case in question" (Rhee, 2004). Hence, conducting a descriptive case study with a qualitative approach was chosen as the design of this research.

Participants

There were thirty-six students worked as the participants in this research. They were chosen by using purposive sampling, in which they were chosen on purpose, i.e., those who joined Literary Criticism class. It was in line with the definition of purposive sampling as "Purposive sampling is intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon" (Robinson, 2014).

Instruments

In getting the data, this research applied an observation sheet and questionnaire. The two instruments were used to obtain the objectivity of the data. Observation sheet was used to get the students' responses in detail about the implementation of project-based learning. Marshall and Rossman (1989: 79), in (Mirhosseini, 2020), define observation as "the systematic description of the events, behaviors, and artifacts of a social setting" (Mirhosseini, 2020). From the definition, it could be said that observation is a systematic way to get data of someone's behavior. It was in line with the purpose of this research, i.e., to analyze and assess students' behavior in the form of creative thinking. The second instrument was questionnaire. Questionnaire was used to collect secondary data from students. Navarro-Rivera and Kosmin define questionnaires as "A very convenient way of collecting useful comparable data from a large number of individuals" (Navarro-Rivera & Kosmin, 2013). The questionnaire was set by using Likert scale. Likert scale was used in designing the questionnaire because it could measure students' perception on their creative thinking skill on project-based learning. There were five Likert scales used in the questionnaire, starting from the weakest one (1) to the strongest one (5).

Data analysis

In analyzing the data, the observation sheet and questionnaire were used. There were seven questions on the observation sheet. Those questions related to students' experience in project-based learning activity. They were then analyzed and written in descriptive statement to elaborate the answer. Questionnaire was used as supplement instrument to get secondary data. There were five questions on the questionnaire. Its function was to clarify students' answer in form of scale so it was going to be easier for the readers to read. The observation sheet and the questionnaire were spread out through Google form. Google form was chosen because it could cover vast area where students live in their hometown during online learning.

Results and discussion

The aim of this research was to analyze and assess students' creative thinking skill on the implementation of Project-Based Learning. Students' creative thinking was important dealing with learning process, especially in project-based learning process. There were four rubrics in assessing creative thinking. They were originality, fluency, flexibility, and elaboration. This research also analyzed students' problem and obstacle in developing their creative thinking.

Implementation of project-based learning

Project-based learning was applied on Literary Criticism class. It covered two different classes in two different academic year. Project-based learning was applied because it could develop students' higher order thinking and creative thinking skills. In implementing project-based learning, this research followed steps from Li, et. al. (2015) There were preparation, piloting, investigating, presenting, and summarizing. (Li et al., 2015)

Phase I: Preparation

Preparation step was the initial step for implementing project-based learning. Li, et. al. (2015) explained the role of teachers/lecturers as teachers/lecturers announced the project to the class, explained the requirements and method of assessment for the project, discussed possible methods of investigation of the topics, and suggested possible topics. Students' roles in this step were making groups, electing a group leader, choosing topics for the investigation, and working out an action plan. (Li et al., 2015). Literary Criticism class applied all these roles for both lecturers and students. 25 students (69.4%) felt ready for project-based learning, while 11 students (30,6%) still couldn't make up their minds whether they were ready for project-based learning or not. In terms of building their confidence in this step, there were 3 student (8.3%) who still did not feel confident, while most of the students (91.7%) felt confident. It could be concluded that most of the students were ready and confident for project-based learning after taking preparation step.

Table 1. Students' response in preparation step

	Yes	No	Maybe
Readiness for the class	25	0	11
Confidence in creating project in the class	33	0	3

Phase II: Piloting

The second step was piloting. Piloting a project meant teachers/lecturers tested the project on a small-scale scope to identify the result. Li, et. al. (2015) elaborated roles of teachers/lecturers as making himself or herself available for consultation during office hours and/or by appointment and offering suggestions and guidance together with the class. Students' roles in piloting were carrying out initial investigation of the project, reporting on any problems encountered in their pilot investigation, and adjusting their plans if necessary (Li et al., 2015). Implementing piloting as the second step provided some benefits. Indeed Editorial Team (2022) mentioned some of its benefits, such as saving time, helping students understand the project's quality and review it, verifying estimated budget, and helping students understand the project's scope and contribute to its requirements (Indeed Editorial Team, 2022). The result of this piloting steps for the students was this step helped students creating and estimating timeframe for their project. Students also took great benefit of the consultation or feedback from the lecturers in this phase. These two results showed that piloting step was crucial. Lecturers could not skip this step as it functioned as a transition for the students on project-based learning.

Phase III: Investigating

In investigating step, teachers/lecturers organized a session of progress reports and offered feedback and suggestions as necessary, while students carried out full investigation and made a progress report on their projects (Li et al., 2015). This step allowed lecturers to give feedback and record students' progress. All students felt that feedback session in investigating step was truly beneficial for them. Feedback session was not only functioned as a session to correct their mistake, but it also functioned to get the students back to the right track.

Phase IV: Presenting

Presenting was the fourth step to consider when it comes to the implementation of project-based learning. In presenting, teachers/lecturers organized presentation sessions for the groups to share their findings. Students' roles in presenting were presenting their findings of the project, answering questions from the class, and obtaining feedback from the class (Li et al., 2015). Presenting step provided many benefits for students, in which they should read more before they presented their finding in the class. It helped students improve their thinking skill and creative thinking at the same time. Students also found their writing skill improved during this step. It might happen because they got many feedbacks from lecturers and class. It showed a good practice of project-based learning.

Phase V: Summarizing

Summarizing was the final step in implementing project-based learning on Literary Criticism class. In this step, teachers/lecturers received the final reports from the groups, assessed the projects in forms of action plan, interim reports, presentation, or final reports, and gave feedback to the students. In other hand, students should summarize their projects, incorporating the feedback from the class, reflect on their projects, write up the final project reports, and submit their reports in this final step (Li et al., 2015). Conducting this step was proven to be beneficial to finish project-based learning in class because this step allowed students to incorporate the feedback and revise their project into a better one. The result of students' writing was more coherence and on the right track.

Assessment of project-based learning

Implementing project-based learning in class was proven to be beneficial for students' thinking skill and creative thinking in the process, but the final assessment of it should be conducted as the output. Students were asked to fill in the questionnaire to find out their difficulty on project-based learning. Twelve students (33.3%) strongly agreed that they faced some obstacles and difficulties in developing their creative thinking during the process, while eighteen students (50%) agreed about it and six students (16.7%) felt neutral and found no big difficulty in developing his creative thinking. Most of students' main problems were about developing ideas into coherence text, structuring or organizing a good text, and choosing appropriate vocabulary to avoid repetition in the text. It might happen because some students were not used to using these components in writing and doing assignment in class. If students are trained to use it more, students' creative thinking is going to be improve gradually and better.

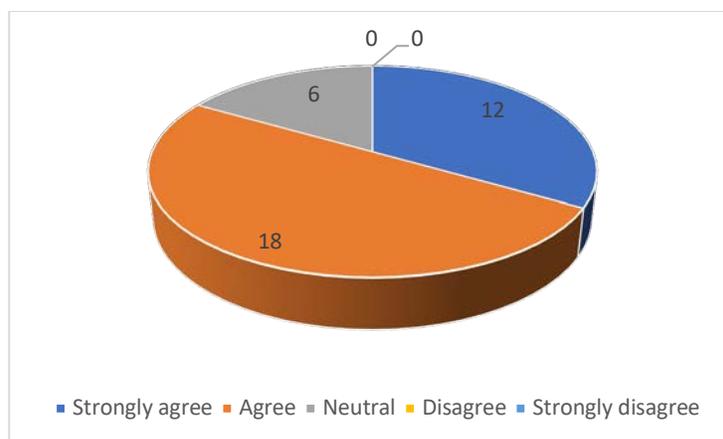


Figure 1. Result of students' difficulty

The second thing needed to assess on the implementation of project-based learning was that project-based learning could help students in developing their creative thinking. There were four main rubrics in creative thinking assessment. They were originality, fluency, flexibility, and elaboration. Originality dealt with “uniqueness of responses to a given stimuli” (O’Sullivan, 2021). In other words, originality related to students’ creativity in giving responses to a specific problem. There were fourteen students (38.9%) strongly agreed and twenty-two students (61.1%) agreed that project-based learning allowed them to develop their originality in giving response. It could be seen as a good practice of project-based learning. Students did not only work on their project, but they also developed their original ideas while doing the project.

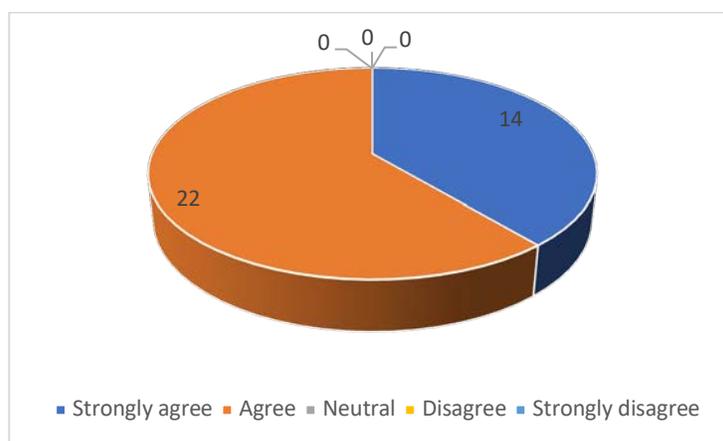


Figure 2. Result of students' originality rubric

The second rubric in creative thinking assessment is fluency. Fluency covers “number of responses produced to a given stimuli” (O’Sullivan, 2021). There were sixteen students (44.4%) strongly agreed and sixteen students (44.4%) agreed that project-based learning allowed them to develop their fluency. Although there were 11.2% of the students felt neutral about it, it still showed good practice. This kind of response might happen because some students started to believe and be confident in themselves in writing and doing assignment. It showed good signal in building students’ fluency.

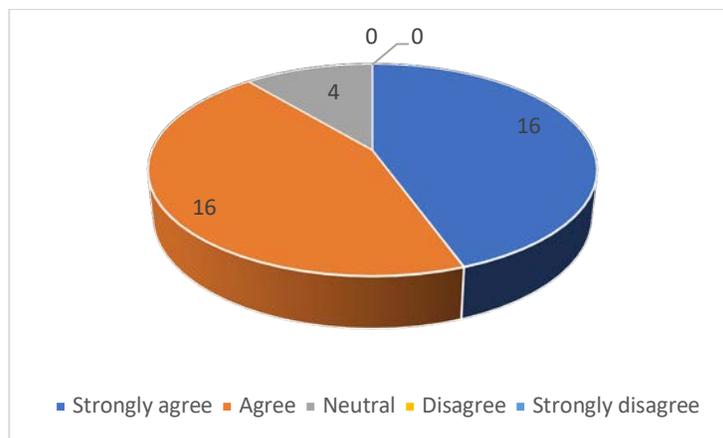


Figure 3. Result of students' fluency rubric

Flexibility was the next assessment rubric that was put into consideration in assessing students' creative thinking on project-based learning. It is "number and/or uniqueness of categories of responses to a given stimuli" (O'Sullivan, 2021). The result of students' flexibility showed that half of the total students (50%) strongly agreed that project-based learning allowed them to develop their flexibility. It was then followed by fourteen students (38.9%) who agreed for the same thing. There were only four students (11.1%) that felt neutral about the flexibility rubric. This result showed great practice of project-based learning in which it helped students develop students' unique way of thinking to explore new ideas and ways to write and solve the problem. It might happen because lecturers let students write and do their assignment in their most comfortable way, so it made students feel relaxed and more willing to write with their own creativity.

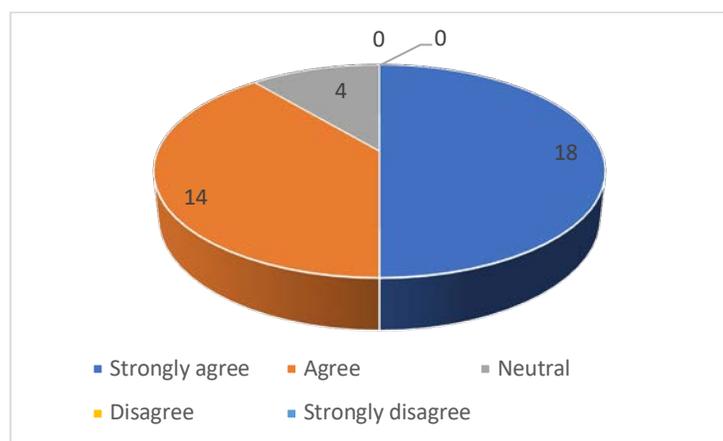


Figure 4. Result of students' flexibility rubric

Last rubric was elaboration. It defined as "to add details to the ideas produced for a given stimuli" (O'Sullivan, 2021). Eight students (22.2%) strongly agreed that project-based learning allowed them to elaborate their ideas, while twenty students (55.6%) agreed with it. There were eight students (22.2%) who felt neutral that project-based learning allowed him to develop his ideas. This flow of response showed that project-based learning was successful in developing most of students' creative thinking in forms of ideas, but still there was a chance of it failed to develop students' elaboration skill. It might happen due to lecturers' intervention during the process. It could cause students still felt attached to the lecturers and failed to elaborate their ideas.

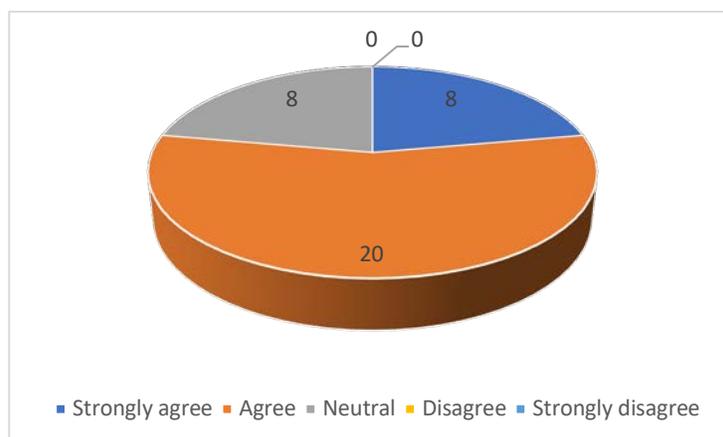


Figure 5. Result of students' elaboration rubric

Regarding the result of finding, it could be stated that the result was in line with the result of some previous researches. The assessment result was in line with Indrawan, et. al.'s (2019) result which exposed the benefit of project-based learning. They stated "Project-based learning stresses education that give odds on the learning system based on learners, collaboratively and integrate the real issues and practical, effective teaching in building knowledge and creativity" (Indrawan et al., 2019). Their finding and this research's finding both proved that project-based learning could improve students' creative thinking by working in team, organizing, and negotiating their ideas to make the project. The finding of this research also correlated with the result of another previous study by Fitriati. She elaborated that project-based learning could be used as a new assessment method in which it helped students to work collaboratively with their peers to solve real issue and also to make students become flexible and creative thinkers who could make use of their knowledge to make a move (Fitriati, 2015). From the results of this research and Fitriati's, it could be implied that project-based learning could be used as a teaching and assessment method to evaluate students' creative thinking.

The result of this research answered the research question, i.e., "How can a lecturer assess students' creative thinking skill on the implementation of project-based learning?" The elaboration of the result showed that lecturers could assess their students' creative thinking skill by utilizing two aspects, the implementation and the assessment of project-based learning. The implementation of project-based learning consisted of five phases. They were preparation (to prepare students for the learning), piloting (to help students understand the project), investigating (to give feedback to students), presenting (to give students chance to present their project and conduct interactive session with their peers), and summarizing (to give students chance to summarize, reflect, and submit their project as the final product). The second was assessing project-based learning in developing students' creative thinking. There were four main aspects on creative thinking, i.e., originality, fluency, flexibility, and elaboration. Considering aspects of implementation and assessment of project-based learning was helpful for the lecturers to assess students' creative thinking skill.

Conclusion

This research puts its focus on analyzing and assessing students' creative thinking on project-based learning. In analyzing the implementation of project-based learning, the five steps should be done in order to make students learn better and to make transition between steps smooth.

They are preparation, piloting, investigating, presenting, and summarizing. Students find each step useful and beneficial in helping them create the project. Feedback from lecturers is also important as the basis for the improvement. In assessing students' creative thinking, it is divided into four main rubrics, i.e., originality, fluency, flexibility, and elaboration. The four rubrics of creative thinking assessment are well-developed through the help of project-based learning. Although, students still find some obstacles and difficulties during the process, project-based learning help students cope with them. It can be said that project-based learning as one teaching method is applicable and beneficial for both lecturers and students.

Declaration of conflicting interest

We, as the researchers, declare that there is no conflict of interest in this work.

Funding acknowledgements

We would like to express our gratitude to LPPM Universitas Jenderal Soedirman, Indonesia for funding this research under the scheme of BLU UNSOED RDU 2022 No. 1134/UN23/PT.01.02/2022.

References

- Al-rawi, I. (2013). *Teaching Methodology and its Effects on Quality Learning*. 4(6), 100–106.
- Aznar, A. (2014). *Different Methodologies Teaching English*.
- Boswell, C., & Carlile, V. D. (2011). *RTI for the gifted student*. Prufrock Press. <http://www.bertiakingore.com/high-gt-create.htm>. <http://www.gifted.uconn.edu/sem/semexec.html>.
- Bytyqi, B. (2021). Project-based Learning: A Teaching Approach where Learning Comes Alive. *Journal of Teaching English for Specific and Academic Purposes*, 9(4), 775–777. <https://doi.org/10.22190/JTESAP2104775B>
- Carlos Tedesco, J., & Operti Massimo Amadio, R. (2013). *The curriculum debate: why it is important today (Original: Spanish)*. <http://www.ibe.unesco.org/>
- Earl, L. (2006). *Rethinking Classroom Assessment with Purpose in Mind: Assessment for Learning, Assessment as Learning, Assessment of Learning*. Manitoba Education, Citizenship and Youth Cataloguing in Publication Data.
- Fitriati. (2015). Assessing Students' Learning in Project-Based Learning Approach. *Visipena Journal*, 7(1), 38–50. <https://doi.org/10.46244/visipena.v7i1.292>
- Gülbahar, Y., & Tinmaz, H. (2006). Implementing project-based learning and E-portfolio assessment in an undergraduate course. *Journal of Research on Technology in Education*, 38(3), 309–327. <https://doi.org/10.1080/15391523.2006.10782462>
- Hamidah, H., Rabbani, T. A. S., Fauziah, S., Puspita, R. A., Gasalba, R. A., & Nirwansyah. (2020). *HOTS-Oriented Module: Project-Based Learning* (1st ed.). SEAMEO QITEP in Language.
- Harmer, N., Stokes, A., Blake, J., Sterling, S., & Kagawa, F. (2014). *The benefits and challenges of project-based learning: A review of the literature*. Pedagogic Research Institute Observatory (PedRIO).
- Indeed Editorial Team. (2022, January 3). *Why Is Piloting a Project Important? And How to Conduct One*. Indeed Canada Corp.
- Indrawan, E., Jalinus, N., & Syahril. (2019). Review Project Based Learning. *International Journal of Science and Research*, 8(4), 1014–1018. <https://doi.org/10.21275/ART20196959>

- Kalargiros, E. M., & Manning, M. R. (2015). Divergent Thinking and Brainstorming in Perspective: Implications for Organization Change and Innovation. *Research in Organizational Change and Development*, 23, 293–327. <https://doi.org/10.1108/S0897-301620150000023007>
- Kanli, E. (2021). Assessment of Creativity: Theories and Methods. In P. Jain (Ed.), *Creativity - A Force to Innovation* (pp. 1–21). IntechOpen Limited. www.intechopen.com
- Li, D., Zhang, C., & He, Y. (2015). Project-based learning in teaching translation: Students' perceptions. *Interpreter and Translator Trainer*, 9(1), 1–19. <https://doi.org/10.1080/1750399X.2015.1010357>
- Masrur, R., Sultana, N., Afzal, M. T., Saeed, M., Azeem, M., & Idrees, M. (2016). *Educational Assessment and Evaluation* (M. Hussain, Ed.; 1st ed., Vol. 1).
- Maulany, D. B. (2013). The Use of Project-based Learning in Improving the Students' Speaking Skill (A Classroom Action Research at One of Primary Schools in Bandung). *Journal of English and Education*, 1(1), 30–42.
- Mirhosseini, S.-A. (2020). Collecting Data Through Observation. *Doing Qualitative Research in Language Education*, May, 61–84. https://doi.org/10.1007/978-3-030-56492-6_4
- Navarro-Rivera, J., & Kosmin, B. A. (2013). Surveys and questionnaires. *The Routledge Handbook of Research Methods in the Study of Religion*, 395–420. <https://doi.org/10.4324/9780203154281-35>
- O'Sullivan, M. (2021). Chapter 4: Innovation and Creativity. In *Developing the Cambridge Learner Attributes* (pp. 53–74). Cambridge Assessment International Education.
- Rhee, Y. (2004). The Employee-Public-Organization Chain in Relationship Management: A Case Study of a Government Organization. In *Unpublished doctoral dissertation, University of Maryland, College Park*. University of Maryland, College Park.
- Robinson, R. S. (2014). Purposive Sampling. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 5243–5245). Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_2337
- Savery, J. R. (2006). Overview of Problem-based Learning: Definitions and Distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1). <https://doi.org/10.7771/1541-5015.1002>
- Tekyiwa Amua-Sekyi, E. (2016). Assessment, Student Learning and Classroom Practice: A Review. *Journal of Education and Practice*, 7(21), 1–6. www.iiste.org
- Thomas, J. W. (2000). *A Review of Research on Project-based Learning*. http://www.bie.org/research/study/review_of_project_based_learning_2000
- Widiana, I. W., Tegeh, I. M., & Artanayasa, I. W. (2021). The project-based assessment learning model that impacts learning achievement and nationalism attitudes. *Cakrawala Pendidikan*, 40(2), 389–401. <https://doi.org/10.21831/cp.v40i2.38427>
- Wulandari, D., Arifin, S., Cahyono, E., Kusumawardani, S. S., Hertono, G. F., Wastutiningsih, S. P., Soetanto, H., Utama, I. M. S., Syam, N. M., Putra, P. H., WY, H. J., Wijayanti, C., & Jobih. (2021). *Panduan Program Bantuan Kerja Sama Kurikulum dan Implementasi Merdeka Belajar-Kampus Merdeka*. Kementerian Pendidikan dan Kebudayaan.
- Wulandari, D., Arifin, S., Cahyono, E., Kusumawardani, S. S., Hertono, G. F., Wastutiningsih, S. P., Syam, N. M., Putra, P. H., WY, H. J., & Wijayanti, C. (2020). *Panduan Program Bantuan Program Studi Menerapkan Kerja Sama Kurikulum Merdeka Belajar - Kampus Merdeka*. Kementerian Pendidikan dan Kebudayaan.

Yuliana. (2021). The Implementation of Freedom to Learn during the COVID-19 Pandemic. *International Conference on Education, Teacher Training, and Professional Development*, 130–134.