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PROJECT-BASED LEARNING: OPTIMIZING STUDENTS' CRITICAL THINKING SKILLS

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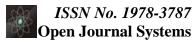**Email: miminaminah@unsub.ac.id**

Abstract
Project-based learning is basically a learning activity that provides space for students to fully learn the scientific competencies need to be mastered. Moreover, this activity also provides space for students to optimize their critical analysis skills towards an issue. The project encourages students to look for creative alternative solutions to solve problems and provide responses to these phenomena. This research conducted descriptive qualitative research design with 3 purposive sampling text. This research show that project-based learning effective to optimizing students' critical thingking with the following indicators: problem identification, clarifying question, logic of argument, evidence/supportive information, synthesis of ideas, references to readings, and problem solving. Furthermore, Critical Thingking skill is basic to help the students look an issue with a good point of of view by finding a logic of argument tha relate with the issue.
Keywords: Project-based Learning, Critical Thinking, Optimizing Skills

PENDAHULUAN

Project-based Learning is a learning activity that is collaborated with a project. The projects carried out objectives that are closely related to the achievements of certain courses. Projects usually require analysis and reasoning from students regarding project completion. Project-based learning also requires students to improve critical thinking skills to see a phenomenon as a whole in order to analyze and find effective ways to complete the project well.

Based on Blumenfeld, et al. (1991) that Project-based learning is a comprehensive approach to classroom teaching and learning that is designed to engage students in the investigation of authentic problems. As stated by Aminah, et al. (2014) that Engagement is an important aspect to increase learning outcomes. It is designed by taking issues that are hotly discussed or are common phenomena in society. This is intended so that students are able to see general phenomena from a scientific perspective and try to find answers or solutions from their scientific perspective. This is also

intended so that students are able to apply the knowledge concepts they have in real life situations. So that scientific mastery is not only limited to theory but also implementation. As stated by Issa, & Khataibeh (2021) that Project-based learning is a modern teaching method aimed at students, connecting students' experiences with school life and stimulating serious thinking as students gain new knowledge.

Project-based also gives more responsibility for learning to students, so that learning is no longer teacher-centered but student-centered which is considered more relevant for 21st century learning. Furthermore, Aminah, et al. (2023) stated In today's curriculum no more teacher centered at class, the curriculum demands students active learning through teaching learning process. The implementation of student-centered learning also focuses on projects that are produced and presented as consideration for the final grade for a course so that this will increase student ownership of learning. They will have a higher

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level of engagement so they will be more responsible for what they do. As stated by Aminah & Maulida (2021) that student involvement in learning is a necessity, both in the form of attention and producing a product. Furthermore, it is also important to ensure that students avoid the phenomenon of low critical thinking skills as stated by Hanum, et al. (2023) One of the causes of the low critical thinking skills of participants is caused by the learning process that focuses on mastering concepts alone without involving students to construct knowledge independently. as said by Wulandari, et al. (2023) that Critical thinking skills are essential in assisting students in the learning process, especially in today's 21st century. Moreover, Maknuunah, Kuswandi, & Soepriyanto, (2021) state that 21st century learning requires students to be able to think critically and be able to solve about the problems around them.

Apart from that, Project-based also provides sufficient space for students to be able to explore what they learn in the classroom. They are no longer fixated on activities and activities that make them fixated on listening, taking notes and remembering them as answers during exams, but students are given enough space and time to understand the essence of learning in more depth so that they understand the science and its implementation as a whole.

Project based learning can also optimize students' critical thinking skills. By engaging the students with real word projects, PBL requires them to analyze information to solve the problem or to achieve the project goals. This condition can be achieved by having a project based system that allows students to have contextual learning experiences, for example, students for the writing for academic purposes course are given a project to compile research background according to the research topic they choose, this project will guide students to observe the topic more deeply by looking at it. research data on similar topics, until finally understanding the concept completely so that

they are able to express thoughts and ideas for their own research concept.

A clear relationship is shown from the use of projects to increase students' critical thinking. This is realized when students carry out learning projects that require them to think about the phenomena around them and provide responses to find solutions to the situation. In this activity, students must at least learn to identify problems that are presented as study material in their projects. Students are trained to have critical thinking to understand a phenomenon, obtain logical reasoning, and try to provide responses in the form of opinions or solutions.

In the project students are also required to analyze information from previously collected data. They are trained to analyze the relevance of the sources they obtain to the topic of their project study. This process clearly trains students' critical thinking skills during the process of sorting sources that are categorized as suitable or not suitable for use as reference sources. Critical thinking is an important skill that students must have, in line with Loyens, et al. (2023) states that Critical thinking is widely regarded as an important competence to obtain in education. Furthermore Alsaleh (2020) that Critical Thinking has been recognized as one of the most important thinking skills and one of the most important indicators of student learning quality.

From the explanation above, it can be concluded that students' critical thinking abilities can be analyzed from several components as cited from Bernstein, Arla, and Isaac (2018) in the following table:

Tabel 1: Critical Thinking Components of Discussion

Components of Critical Thinking	Source(s)
Problem identification	Hsiao, Chen, & Hu (2013); Mertler (2001).

Clarifying question	Gilbert, & Dabbagh (2005);Wegmann & McCauley (2014).
Logic of argument	Health Care Ethics: Discussion Board Guidelines (2016); Rezaei & Lovorn (2010);Wegmann, & McCauley (2014).
Evidence/supportive information	Health Care Ethics: Discussion Board Guidelines (2016); Rezaei & Lovorn (2010);Vandervelde (2016).
Synthesis of ideas	Hsiao, Chen, & Hu (2013); Rezaei & Lovorn (2010);Wegmann, & McCau- ley (2014).
References to readings	Cato (2010); Frey (2016); Gilbert (2005); Lynch, et al. (2009);Vandervel- de (2016);Wegmann (2014).
Problem solving	Hsiao, Chen, & Hu (2013);

Furthermore, the project encourages students to look for creative alternative solutions to solve problems and provide responses to these phenomena. Students are trained to sort alternative solutions and consider the advantages and disadvantages of each option in order to find the most effective solution.
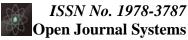
METHOD

This research conducted descriptive qualitative research design. Based on Sugiyono (2010) who states that qualitative research is descriptive. It means that collected data was in the form of words rather than number. In addition, Gay, et al. (2012) stated that qualitative research is the collection, analysis, and interpretation of comprehensive narrative and visual data in order to gain insights into a particular phenomenon. This research designed in the second semester of university students. This research conduct during a semester to analyze students critical thinking during the lecture. The students were asking to write a persuasive text with certain topic. In the half of the semester they are discussing about the concept of writing and how to create a good text. After reflect their concept of writing, they asked to choose a partner for the project. Their text, their choosen topic, and their perspectives and opinion about that topic were analyzed as their critical thinking. The text also has to be analyzed by a partner as a group learning and its has to be presented in the next week. Further more, after every presentation the researcher facilitate the reflection. It helps to push the students criticize the other group project.

PARTICIPANTS

This research was conducted in second semester of University students. It employed purposive sampling by selecting the participants from students on purpose (Gay, Mills, & Airasian, 2009; Silverman, 2005). Purposive sampling also aims to ensure that the data being analyzed is valid, because the sample selection will be in accordance with the student characteristics needed for analysis. Furthermore, The participants were taken from 3 students from 3 groups and 3 text as a result of their writing project. These group were taken because they can present their poin of view with smart and logical supporting sentence in each paragraph presented.

PROCEDURE OF COLLECTING DATA

Data was obtained from 3 selected samples based on reflections on the resulting writing projects. The 3 people came with 1 text each containing persuasive text. In this text, the focus of discussion is limited to the topic "education", they are welcome to choose any

title as long as the writing has an educational theme. This is also intended so that students are able to see the phenomenon of education in Indonesia, from a policy and implementation perspective, as well as provide responses to the chosen writing topic. Another reason underlying the choice of topic is that the students sampled are prospective teachers, so it is hoped that a critical mindset will help them see and analyze a phenomenon well for the advancement of education in Indonesia..

Text genre that is presented in front of the class by group members and then reflected on to discuss the writing with class colleagues. The text is discussed from the level of ideas, writing, logical reasoning to the coherence and cohesion of the text. This reflection activity is a means of analyzing students' critical thinking, how they can see the integrity of a piece of writing and provide alternative solutions so that the text displayed is better.

DATA ANALYSIS

The following data displays 3 texts produced based on the selected genre, with an indication of the critical thinking of each text produced:

Table 2: Persuasive Text

No.	Tittle	Text	Critical Thinking Indikator(s)
1	School Uniforms 2024: Towards Better Education!	Imagine a world where every student goes to school wearing comfortable, modern uniforms that reflect their national identity. This is the vision intended to be realized by the new school uniform policy set to be implemented in Indonesia in 2024. According to an article published on Kompas.com titled "School Uniforms Change After Eid 2024, Here's What the Ministry of Research and Technology Says," this policy brings various significant benefits that we need to support. However, this policy doesn't come without	The first thing that is an indicator of a student's critical thinking ability is to include official news sources that are hot topics of discussion regarding changes in the issue of changing uniforms for elementary, middle and high school students. An issue that is based on clear sources and is currently open to debate.

challenges. Many parents are worried about the additional costs they'll have to bear to purchase new uniforms. Additionally, there are concerns about the readiness of schools to implement this change and the possible mismatch between the new uniform design and the unique local cultural identity in different regions. Is this change really necessary? Are the benefits worth the challenges?

It's important to note that the Ministry of Research and Technology emphasizes that the replacement of school uniforms isn't mandatory. In its official statement, it states that "School uniforms don't have to be replaced, but schools are given the freedom to adjust to their respective needs and conditions." Furthermore, Anang Ristanto from the Ministry of Education and Culture explains that this rule still aligns with Minister of Education and Culture Regulation No. 50 of 2022 regarding school uniforms for students in primary and secondary education. This means that each school has the flexibility to determine the policy that best suits their conditions and capabilities, without burdening parents or disregarding local cultural identity.

With this flexibility, we can see that the replacement of school uniforms in 2024 is a golden opportunity to improve the quality of education and student welfare. New uniforms designed with high-quality materials will enhance student comfort, allowing them to learn better and be more productive. Modern and aesthetically pleasing designs will instill pride and confidence, while efforts to reflect national

The second indicator is the ability to lead the reader's opinion by presenting clarifying questions presented at the end of the second paragraph, inviting the reader to also think about the same thing.

In this text, students also present supportive information which gives the impression that this writing is balanced between the facts of the underlying rules and opinions from the students' own point of view.

In the last two paragraphs the logic of argument is also given which supports the statement in the previous paragraph.

		and local cultural identity in the uniform design will strengthen pride as Indonesians. Let's support this policy, not only because the new uniforms will enhance students' appearance, but also because it's a step forward towards a more inclusive, comfortable, and sustainable education. With all our support, this change can become a strong foundation for building a better, more confident, and more culturally aware younger generation.		Without a college degree, individuals find it increasingly difficult to compete in the global market job. Additionally, college plays a pivotal role in the shaping an individual's character and personality. Throughout their academic journey, students gain not just theoretical knowledge but also valuable lessons in discipline, responsibility, teamwork, and social skills. These experiences are indispensable in professional and personal life, nurturing individuals into productive and responsible citizens. Moreover, colleges and universities are at the forefront of innovation and technological advancement. University-led research often paves the way of breakthroughs that drive progress across various sectors, from healthcare to information technology. By dismissing college as a tertiary need, we overlook the vast potential unlocked through higher education. College also profoundly influences an individual's mindset. Students are trained to think critically, assess information thoroughly, and develop logical, evidence-based arguments. This critical thinking ability is essential in everyday life, enabling individuals to make informed decisions, solve problems efficiently, and adapt to the swift changes in today's world. Furthermore, college fosters openness to new ideas and diverse viewpoints, which is crucial for building tolerance and cooperation in a multicultural society. With a more refined mindset, perhaps the phrase, "college is a tertiary need" would never be uttered by someone who work in the Ministry of Education.	given which firmly shows the students' disagreement with the statement that was the issue presented in the first paragraph.
2	College: More Than Just a Tertiary Need	In the rapidly evolving landscape of modernization and globalization, higher education often finds itself relegated to the status of a tertiary need, frequently overlooked in favor of primary necessities such as food, shelter, and clothing. The Ministry of Education and Culture (*Kemendikbud*) has even remarked that "higher education is often seen as tertiary need, after other basic needs are met." This perspective, however, warrants a thorough re-evaluation. College is not a mere luxury; it is a critical investment for the future of individuals and the nation. **"College is not a mere luxury; it is a critical investment for the future of individuals and the nation."** Firstly, attending college significantly enhances employment prospects. Statistics indicate that college graduates are ore likely to secure higher-paying jobs compared to those with only a high school diploma. In today's Industry 4.0 era, numerous emerging professions demand specialized skills that can only be acquired through higher education.	The second text also shows good critical thinking skills by discussing issues that are hotly discussed in the world of education regarding the discussion that college is a primary need in the world of education. Students in this text explain the logic of a good argument by saying that education plays an important role in job opportunities by increasing certain skills which are focused on in higher education. The logic of argument is also given in the next three paragraphs, so that the student has a comprehensive and in-depth analysis of the topic. The end of the text is also closed with a synthesis of all the ideas presented in the previous paragraphs and a re-statement is		

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3	Enhancing Student Well-being: Addressing Academic Stress	Today, we address a serious yet often overlooked issue: academic stress among students. Amidst the pressures of assignments, exams, and high expectations, many of us feel trapped in the grips (grip) of anxiety and fatigue. However, it's time to change this narrative. Let us together explore (explore together) the importance of addressing academic stress to enhance student well-being. First and foremost, let's acknowledge that academic stress is not trivial. Its impacts (impact) can transcend the boundaries of classrooms and study spaces, affecting physical health, mental well-being, and social relationships. Students constantly pressed (pressured) by mounting tasks may experience anxiety, depression, or even burnout. This is why it's crucial for all of us to collectively bring this topic to the surface and seek effective solutions. Second, let's show empathy towards fellow students experiencing stress. Everyone has their own limits, and what may seem easy for one person could be a heavy burden for another. Social support and understanding from peers, professors, and academic staff can make a significant difference. Be a good listener, offer assistance, and be inclusive (of) towards those who may be struggling. Furthermore, let's develop concrete strategies for managing academic stress. This includes effective time management, setting priorities, and utilizing available resources such as counseling services and academic support on campus. Developing time	In the third text, critical thinking abilities are also visible from the problem identification presented by the author regarding stress issues experienced by students in learning activities. Another indicator of critical thinking shown in this text is the logical argument presented in supporting paragraphs which support ideas by explaining the facts of the situation and their effects on certain individuals. The last indicator that is visible from this text is the author's efforts to try to provide alternative solutions to the learning stress faced by students by dealing with strategies that a student can use.	management skills and learning to recognize signs of stress are crucial steps in the journey towards better well-being. Last but not least, let's demand that educational institutions create environments that support student well-being. This includes providing easy access to mental health services, offering comfortable study spaces, and reducing disproportionate workloads. By speaking up and taking action together, we can build a more inclusive, sustainable, and student-friendly academic environment. So, let's commit to addressing academic stress and creating a supportive learning environment for all students. By doing so, we're not only advocating for personal well-being but also shaping a culture of education that's (which is) more empathetic, caring, and resilient. Together, we can transform the learning experience into a journey of happiness and achievement in Solidarity.	

DISCUSSION

Project-based learning is basically a learning activity that provides space for students to fully learn the scientific competencies needed to be mastered. More than that, this activity also provides space for students to optimize their critical analysis skills towards a phenomenon. From the three texts above, they can represent indicators of students' critical thinking regarding a phenomenon. Starting from problem identification of phenomena that are hotly discussed, clarifying questions that are asked to direct readers to focus on the same topic, in the text presented students' critical thinking skills are also honed by being able to explain the logic of the argument that is coherent in each text written.

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Moreover, References to reading and supportive information in a text help to clarify, explain, or reinforce the main points or arguments. The last but not least students are able to provide a good synthesis of the information presented in the text, are able to mark and close the text with the message with the perspective they present. Furthermore, problem solving abilities in responding to certain phenomena are also critical thinking skills that students need to have in the process of completing projects in class.

CONCLUSION

From the data displayed above, it shows that project based learning provides sufficient space for students to understand learning concepts and apply them in conceptual projects. From this project, where students are asked to write a piece of writing related to an issue that is hotly discussed in the world of education, it shows that they are able to analyze the situation and show good critical thinking so that they are able to provide views with intelligent logic of argumentation and provide alternative problem solving on the issue. This already represents that the project is able to optimize students' critical thinking.

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