

## THE IMPLEMENTATION OF PROJECT-BASED LEARNING IN HIGHER EDUCATION: A CASE STUDY IN THE INDONESIAN CONTEXT

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### Abstract

The implementation of project-based learning has been the center of the teaching and learning process in higher education especially in Indonesia. Higher degree education including universities that implements the project-based learning model. Along with the practical use in class, there is a need to clarify whether the project-based learning has been well conducted. This study is conducted through qualitative approach to dig depicted picture of the implementation of the teaching model. The data were gathered through observation and in-depth interview which were analyzed using qualitative data analysis. The observation covers the preparation of the class like checking the lesson plan, syllabus, learning materials, and the instructional model used. The observation has also been done during the implementation of the lesson plan. The in-depth interview was done through conducting interview with the lecturers and the students about the implementation of the instructional model. The result of the study presents that the implementation of project-based learning was done in a number of ways and stimulate the development of the students' skills. The implementation of the model was done in various ways covering the three main processes: preparation, implementation, and evaluation. The model implemented facilitates the students' problem-solving skills, critical thinking skills, communication skills, collaboration skills, and information literacy. As the students developed their life skills, the teaching through the project-based learning model can be done creatively depending on the learners' and teacher's characters and the learning facilities.

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## INTRODUCTION

Project based learning has been implemented in the teaching of English in Indonesian context. The implementation of the model is done by the implementation of the *Kurikulum 2013* (Mudarwan, 2017). In line with the main goal of the curriculum, the project-based learning covers the needs of conducting more reliable, valid, and functional use of life skills to stimulate independent learners. The life skills are equivalent to the 21<sup>st</sup> century skills including critical thinking, problem solving, communication., and collaboration (Devkota et al., 2017). The core process of project-based learning facilitates the four 21<sup>st</sup> century skills. The project addressed in the model is the collaboration of working task that students have to do to solve a problem

given. To come to an effective solution, the students should criticize the problem and solution. The communication and collaboration processes are the symbol of life skills, human as human being.

One of the university's main performance indicators that must be met to achieve the mission is to apply case-based learning and project-based learning (IKU 7 numbers 2.1 and 2.2). IKU stands for *Indikator Kinerja Utama* or main performance indicator of university performance. To achieve the IKU, university implement the project-based learning. The application of case-based learning is to solve a problem according to 21st century skills. Discussions are also carried out as an effort to solve problems with the most appropriate solutions (application of communication skills, critical thinking, collaboration, innovation and creativity). In the project-based learning approach (PBL) students have the opportunity to solve problems from a case and present their work of thought in groups. During the process, students are entitled to constructive feedback for the development of students' 21st century skills.

The Faculty of Teacher Training and Education, a state university is one of the faculties in state universities in Indonesia where one of its missions is to provide education that produces graduates who excel in the field of resource and wisdom-based entrepreneurship. To achieve this goal, state university strives to organize a learning process that is in accordance with the demands of scientific and technological developments. Learning activities lead to the development of skills needed by prospective users with mastery of 21<sup>st</sup> century skills (critical thinking, problem solving, metacognition, communication, collaboration, innovation and creativity, and information literacy).

Based on the results of preliminary observation conducted by the research team in several classes at FKIP state university, case-based learning and project-based learning have been implemented. In some classes, the implementation of project-based learning has been carried out by facilitating students with a case and students are asked to analyze the case and find solutions to the case. In other classes, the PBL approach has not emerged clearly because the process is still ongoing with explanations from lecturers related to the basic theories of certain scientific fields. Referring to the lesson plans that had been prepared previously, the project-based learning had been written and received a portion that was in accordance with the IKU.

Theoretically, the project-based learning approach has processes that must be met by lecturers and students. CBL (case-based learning) is an approach that has a certain process to activate students in participating in hypothetical problem situations and reflecting on existing experiences in accordance with the scientific field of (Ertmer & Russel, 1995; Asbjornsen, 2015). The key to implementing case-based learning is to create cases for educational purposes and to facilitate activities related to these cases (Salewong et al., 2012). The challenge that most often arises in the application of case-based learning is the application of pedagogical activities in cases that are raised in accordance with the learning objectives. One of the studies that tested the effectiveness of the application of case-based learning found that the problem that emerged was the lack of clarity in the cases raised in the learning process (Thistlethwaite et al., 2012).

In project-based learning, students are given a problem and they are asked to analyze the conditions and find the best solution. The steps contained in project-based learning include the process of preparation, implementation, and evaluation. The whole series of activities is carried out to develop students' ability to think critically, creatively, communicatively, collaboratively,

and as a solution to problems that arise (Trilling & Fadel, 2009; Sisamud et al., 2023). The ability to think critically is to make the students able to analyze and implement the higher order thinking skills. Working collaboratively requires the students creativity and communication skills to find the best solution to the problems faced.

Project-based learning has a basic approach, involves action-based, experience-based, and perception-based which is rooted in Dewey's findings (experiential learning). The focus of learning is on lifelong or continuous learning (Beckett & Slater, 2019) to be able to master the required knowledge and skills. Case-based learning is a deepening of theory that is realized in work practice. Case-based learning trains students' skills to solve problems with the ability to plan and adapt (Kolodner, 1993; Wanglang & Chatwattana, 2023). Based on this study, the application of two models of case-based learning and project-based learning can be one way to develop students who are able to think creatively, critically and accurately in solving cases or problems with a reflection process.

According to Sutarto and Indrawati (2013) the project-based learning model should have (a) syntax is the steps in the learning model; (b) the social system is the situation and norms that apply in the learning model; (c) the principle of reaction is the pattern (form) of the teacher's activities in treating or responding to students; (d) the support system is all the facilities, materials and tools needed to support the implementation of the learning model; (e) instructional impact is learning outcomes that are achieved directly by directing students to the desired goals; and (f) The impact of accompaniment is other learning outcomes resulting from a learning process, as a result of the learning atmosphere experienced directly by students without direction from the teacher.

Project-Based Learning is a learning model that uses problems as the first step in collecting and integrating knowledge based on student experience in real activities. This model is designed to be used in complex problems that students need to investigate and understand. Project-based learning is a learning model that provides opportunities for teachers to manage learning in the classroom by involving project work (Thomas et al. 1999; Zhang et al., 2023). Through project work learning, students' creativity and motivation will increase (Clegg, 2001; Maros et al., 2023). Project work can be seen as a form of open-ended contextual activity-based learning and is part of the learning process that places a strong emphasis on problem solving as a collaborative effort (Richmond & Striley, 1996; Ozkan, 2023) carried out in the learning process over a certain period (Hung & Striley, 1996; Ozkan, 2023; Dillon, 2023). It can be stated that the project work contains complex tasks based on very challenging questions and problems and requires students to design, solve problems, make decisions, carry out investigative activities, and provide opportunities for students to work independently. The goal is that students have independence in completing the tasks they face.

Project-based learning learning model is a learning model where students in groups are asked to create or do a project and present the results of the project. (Sampurno, 2007) This learning model usually attracts students to students because it is usually carried out outside the classroom and even outside school, and is valid for some time, not limited to one school hour. Founded by Hanifah and Bharati (2019), the project-based learning is better implemented through the use of watsapp than using wlog to support the students; writing class. Many things can be gained from this project, including; (a) comprehend theoretical principles more deeply because doing something; (b) cooperation with friends is better because we do it together, and (c) there is an advantage that is getting results from the project itself.

The project approach model is one of the learning models that helps students explore information, ideas, skills, values, ways of thinking, and how to express themselves by looking at projects that have been provided by the teacher. In addition, the teacher also teaches students how to find ideas related to the available projects. By completing the project of the class, the students identify problems, analyze the problem and possible solution, and decide a certain solution to the problem. One of the teaching strategies that emphasizes student activity is the project approach method.

The use of the project-based learning model can share benefits for students, teachers and the development of school quality. First, it can prepare students to face and develop in accordance with the real world. Second, the implementation of project-based learning increases students' motivation to learn, encourage their ability to do important work (Chiang & Lee, 2016). Third, it is connecting learning in school with the real world. Fourth, the implementation of student projects are not only memorizing facts, but also into the real world. Fifth, forming student work attitudes, in working on projects students are invited to listen to each other's opinions and negotiate to find solutions through the development of the students' thinking skill (Anazifa & Djukri, 2017). Sixth, it will improve communication and social skills. Seventh, this will improve the students' problem solving skills. Eighth, this enables improving students' skills to use information with several disciplines they have. Ninth, the use of project-based learning will increase student confidence. Finally, it will improve students' ability to use technology in learning.

In relation to the language proficiency, the use of project-based learning stimulate the mastery of the language (Poonpon, 2019). Through the process of interdisciplinary learning, the students do not only learn how to deal with the language but also the knowledge about the field they are trying to learn. The delivery information of the knowledge is conducted by following the project steps through effective language use.

In order to develop a project to attract students to undertake and add to their depth and knowledge, several properties of the project need to be considered such as (a) projects should challenge students to do and complete; (b) the results are beneficial for the groups and the students themselves; (c) the project is not so easy that it is challenging, but not so difficult that it can be completed; (d) the project has an element of making something or researching something that can't be done yet; (e) projects allow students to work together intensively; (f) projects should be multidisciplinary so that they are knowledgeable and can understand the problem thoroughly

The characteristics of the project-based learning model in Trianto (2014) include (a) content, the content in project-based learning is focused on students' ideas, namely in forming their own picture of working on relevant topics and student interests that are balanced with everyday experiences; (b) condition, which means the condition to encourage students to be independent, namely in managing assignments and learning time; (c) activities, as an effective and interesting strategy, are in finding answers to questions and solving problems using skills; and (d) results, meaning the application of productive results in helping students develop learning skills and integrate them into perfect learning.

This study is aimed at providing clear explanation on the implementation of project-based learning in university level classes. the questions address are (1) how is the preparation of the project-based learning? (2) how does the teacher conduct the project-based learning in the class? and (3) how is the evaluation process of the project-based learning. those three

questions are briefly elaborated through a qualitative research method. Those are to fill the commonly problems faced in the implementation of project-based learning that often leads to doing for the sake of doing (Barron et al., 1998) also the emphasize of individual tasks in learning process and force group works with limited interpersonal skill development (Kłeczek et al., 2020).

## **RESEARCH METHOD**

### **Research Design**

This research constitutes a qualitative inquiry designed to systematically elucidate, document, analyze, and interpret phenomena manifesting in the field. Positioned within the realm of descriptive research, the primary objective is to acquire comprehensive insights into the present state of affairs and subsequently investigate the interplay among extant variables. Specifically, the focus of this investigation centers on delineating the intricate nuances of the implementation process of project-based learning within the context of the Faculty of Education and Teacher Training at a state university. Consequently, the units of analysis for this study are the classes within the aforementioned academic institution, as they represent the primary loci where the specified instructional approach is being executed. This approach ensures a meticulous and contextually grounded exploration of the subject matter, thereby contributing to a nuanced understanding of the dynamics inherent in the implementation of project-based learning within the educational framework of the designated university.

### **Research Instruments**

This study implements observation, in-depth interview and documentation techniques in data collection. Observation data collection techniques are used to get a real picture in the field related to the implementation of the learning process. Meanwhile, the documentation method is carried out by reviewing the supporting documents in relation to the implementation of project-based learning. The in-depth interview was carried out by interviewing the students and the lecturers about the implementation of the project-based learning. Through in-depth interview, the researcher may get data across boundary to pass across other's perspective so the meaning can be learned and significance (Mears, 2012). The questions addressed involved semi-structured questions that are used to answer of the research questions. Through the three techniques in collecting the data, the qualitative data were analyzed by applying descriptive qualitative method. The descriptive qualitative method was done by coding the data, reducing the data, analyzing the data, and drawing conclusion from the data. The validity of the findings was carried out by using the data triangulation method.

### **Data Analysis**

The dataset under consideration comprises information pertaining to the implementation of project-based initiatives. An analytical approach, grounded in a qualitative framework (Miles et al., 2014). It was employed to scrutinize the data. The analytical framework applied in this study involved a systematic progression through distinct stages aimed at elucidating the intricacies of project-based learning (PjBL) implementation. The initial phase, data reduction, entailed the refinement of the dataset to its fundamental components, specifically focused on aspects related to the execution of PjBL. Within this context, information was categorized, including details on how educators incorporated PjBL methodologies into their instructional

practices. Subsequently, the analysis progressed to the data display phase, which involved the methodical presentation and organization of pertinent information garnered from educators. This stage facilitated a structured examination of the information provided by teachers, contributing to a more comprehensive understanding of the nuances associated with PjBL implementation. The concluding phase of the analytical process centered on drawing inferences and interpretations from the analyzed dataset. This involved synthesizing the refined information to derive comprehensive insights into the dynamics of project-based learning implementation. The methodological approach employed in this study aligns with established qualitative research practices, ensuring a rigorous and systematic exploration of project-based implementation data. Through this meticulous analysis, meaningful insights are gleaned, and conclusions are substantiated, thereby enhancing the scholarly understanding of the project-based learning paradigm in educational contexts.

## **RESEARCH FINDINGS AND DISCUSSION**

The discussion of this study is elaborated in three terms based on the process of conducting project-based learning including preparation, implementation, and evaluation. Those are discussed in terms of the basic principles of the project-based learning. The implementation of problem solving, providing constructive feedbacks, providing resource and wisdom-based entrepreneurship, sharing critical thinking, implementing metacognition, facilitating positive communication, providing collaboration, developing the students; innovation and creativity, developing information literacy, and facilitating the students with the case. Each aspect has been analyzed in accordance with the three main process of conducting project-based learning described as follows.

### **The Initial Process of PBL**

The process of conducting project-based learning is the preparation that becomes the initial process of conducting the project-based learning. To deal with this step, there are several aspects that should be done to accommodate the students with the main goals of conducting project-based learning. The implementation of problem solving, providing resource and wisdom-based entrepreneurship, developing critical thinking (Isabekov & Gulzat Sadyrova, 2018) is to create innovation and creativity. Those aspects begin with facilitating the students with the cases as the stimulus of their critical thinking (Rosiyana et al., 2019) in analyzing the case through the process of metacognition and followed by creating problem solving (Chiang & Lee, 2016). In the creation of problem solving, the students investigate activities to design by making decisions through working independently and in groups. To support the development of proper design, the students need to have resource and information literacy.

To start the process of criticizing the case, the students access the cases that relate to the real-life world (Burke, 2020). The real-life world-based case presents the possible happenings in the students' daily life and reflecting the future problems that the students might face in their professional context. PBL involves students in creating knowledge and solving problems by engaging in purposeful, real-world interdisciplinary activities. Referring back to the data, the use of real-life world problem has been done by several subjects for example in English education department, the subject course named English materials development for children has been done providing the students with the problems of sufficient English learning materials for elementary students levels. The students analysed the use of English materials from any selected

books that interest them. However, the lecturer started the class by providing sufficient information about the criteria of effective English learning materials including the process of teaching and learning and the tasks addressed in the textbooks (Devkota et al., 2017). The use of the textbook in the class should meet the minimum requirements of the needs and wants of the students' learning.

In another subject, the subject *Pengembangan Materi Ajar* (Developing Learning Materials) started by providing the students case through case-based learning. The students were asked to analysed the current textbooks. The analysis was done based on the learning goals of the textbooks including the cognitive competence, psychomotor competence, and affective competence. The students also considered the aspects of values in Pancasila (the five principles of Indonesian ideology) as mentioned in Kurikulum Merdeka (Independent Curriculum) in which there are six dimension including having faith, believe in God, good attitude, independence, working together, global diversity, critical and creative thinking. This supports with the use of case-based learning to develop the students' critical thinking skill (Anazifa & Djukri, 2017).

The goals of the course (*Pengembangan Materi Ajar*) is to be able to produce a learning material based on their review process of the existed learning materials. Students consider the aspects of final goals of the grade or class through its indicators; the purpose and the topic of the learning materials, and the learning materials that covers cognitive competence, psychomotor competence, and affective competence. Those are embedded in the final project which was developing a learning material that is integrated to the Pancasila based-learners' profile and the language skills (Setiyaningsih & Wiryanto, 2022).

The presentation of the case was done by sharing the lecturer's experiences on the English textbook materials that support the students of young learners. The selected textbook was analysed and this becomes the case of the students that they need to find the gap between the desired and the existed condition of the textbook. The case was about the real use of the textbook in English classroom and this should meet the demands of the curriculum implemented (Kurikulum 2013). Based on the curriculum, the students learn English as their local content that is used just as an additional subject of the program. The main purpose of the English subject is to be able to communicate in English in limited context of school including the skills of listening, speaking, reading, and writing. The implementation of communicative competence is undergone in the teaching of English in elementary school level and the strategy use is the instructional strategy. These two major aspects of the English teaching in elementary school level are based on the implementation of the textbook analysis.

From their analysis of the textbook they have selected, the students were asked to make a report on their analysis and create a solution for the problem that they have to do to fulfil the missing aspects of the book. The students were asked to find the case for their next step activity. The case is the problem that is realistic ill-structured problem and in project based learning, driving question (Silver-Hmelo, 2004). From the case, the students were also possible to make the possible betterment of the analysed book as their solution to the case or problem (Rodzalan & Saat, 2015). They can reconstruct the tasks to the expected activities and learning materials. During the process of critical thinking the students analyze the case and collect information to find best solution to the case. The students might also have the experience of collaboration with their group members or other parties of the class. Working in groups requires the students' ability to work collaboratively to come up with the best solution of their project based on the

cases they have analyzed (Almulla, 2020). To analyze the cases, the students should develop their critical thinking skills or the higher order thinking skills. Because they work in group, they can share their analysis to their group and collaborate to work in the next step.

### **The Implementation of PBL**

The next step of the project-based learning is the implementation. The implementation process is the step in which the students implement the design after they have made decisions through working in group and independently. The design is developed based on the analysis as best solution for the case they have faced. The subject English Materials Development for Children, for instance, requires the students to be able to reconstruct or develop more appropriate and effective English textbook for the students at elementary school level. The betterment or the new developed textbook was done based on the results of the students' analysis. This is another process of critical thinking and collaboration in which they are exposed to the lifelong learning (Green, 2015).

During the implementation process, the students' work was critically reviewed by both the lecturer and other students in the class. This process was aimed at providing constructive feedback (Ching & Hsu, 2013) not only to the betterment of their works but also to the self-development of the students. The constructive feedback was done by the lecturers first to the products they have developed based on the criteria of an appropriate English materials (for the subject of English Materials Development for Children). Constructive feedback is to develop the students' ability on the aspect reviewed. Providing constructive feedback to the students help them fill the gap between the current performance and the desired performance (Ali Al-Hattami Asst, 2019). It is also a positive action to develop deep learning and meet the expected learning goals. In this study, the follow up of the constructive feedback has not been analyzed and will be further research study.

In the same phase, the students are also required to train their critical thinking skills in response to the process of analyzing and finding best solution to the case. The critical thinking skills are trained in the process of analyzing the design and the implementation of the design as the solution to the case. As the critical thinking skills are improved, the higher order thinking skills are well developed either (Widana, 2018). The students analyze the possible challenges and opportunities might happen in the implementation of the design. For the subject of English Materials Development for Children, the students were asked to implement their design of the learning materials plan. They developed the English materials and shared their works to their classmates to get the feedback of the design they have developed. The higher order thinking skills are employed in this phase to meet the main goal of designing appropriate and effective English learning materials for children

To be able to revise the design the students have developed, they need to work collaboratively to make innovation and creativity. The innovation and the creativity of the students are needed in the process of analyzing the product and revising the product as collaboration can maximize the wider range of academic outcomes (Mulholland & O'Connor, 2016). The innovation lies before and while the process of the betterment of the product while the creativity lies on the process of revising the product. The combination of both innovation and creativity can be one of the possible actions to develop better product. The suggestions and comments from the pairs and lecturer can be accepted and denied if the students have strong

arguments to keep the idea. This presents that the students need to be able to build strong and positive communication and critically to stand their argument.

Central to the implementation process is the foundational concept of fostering open-ended contextual activity-based learning. Within this paradigm, open-ended activities serve as a pivotal mechanism, affording students the autonomy to operate within their own parameters, catering to their preferred learning styles and enabling them to explore their interests while generating work commensurate with their individual abilities (Hertzog, 1998). This pedagogical approach grants students the liberty to make informed decisions regarding both the content and method of their activities, thereby facilitating a purpose-driven learning experience. An illustrative instance of this instructional philosophy is discernible in the context of the English Materials Development for Children class, where students are empowered to exercise autonomy in formulating English learning materials tailored for children. In this educational setting, the students are not only at liberty to select the content and approach of their activities but may also engage in differentiated instruction that aligns with the distinct characteristics of each learner—an instructional principle that underscores the fundamental considerations in facilitating effective learning experiences. This approach emphasizes the nuanced and student-centric nature of the instructional framework, fostering a dynamic and personalized learning environment in line with contemporary educational principles.

### **The Evaluation of PBL**

The final process of the project-based learning is evaluation in which both the lecturer and the students evaluate what they have done during the class. During the evaluation, there are some processes that the students and lecturer should deal with. Those include giving constructive feedback, developing critical thinking skills, conducting metacognition, and conducting communication. The constructive feedback in the evaluation process is conducted by providing more opportunities for the students to make their own betterment based on the feedback (Ali Al-Hattami Asst, 2019). The students will not only evaluate what they have achieved in terms of their academic achievement but also their affective and psychomotor ones. During the evaluation, the students criticize their new experience and achievement in relation to the contextual needs that the students will have in their daily life. They critically review what they have conducted during the class and the same thing for their classmates. After the students and the teacher criticize the achievement, they need to communicate their results to the class to discuss their points of view to the ones they criticized. This can be one of the students' opportunities to work collaboratively and develop their discussion skills through analytical process. In this process, the students train their communicative skills to deliver their purpose of communication effectively.

Reflecting the concept of project based learning mentioned by Dewey , the notion of learning is conducted through doing (Rolfe, 2014). This concept has been implemented in several classes that can stimulate their students to work in a project as mentioned in the previous class elaboration. The students work completely as a whole in the project to deal with the case arises. Learning by doing was implemented by stimulating the students to keep up with the case and conducted critical thinking skills and creative skills to innovate the best way for the solution to the case. They also evaluate the solution they have made to measure that their solution was appropriate and effective for the problem. The should reflect whether they have done true independent work and also cooperative teamwork to support the independent work (Kovácsné

Pusztai, 2021). Through this range steps of the project-based learning, the students have their opportunities to experience the process of learning to develop their 21st century skills (creativity, collaboration, critical thinking, and communication skills).

## CONCLUSION

The implementation of project-based learning is considered to be one solution of conducting self-learning paradigm. Both the students and the teachers are responsible to actively participate in the teaching and learning process to achieve the goals of the learning. regarding the results of the study, the implementation of project-based learning is varied in practice due to the teachers' and students' learning characters and competence. The collaboration of those aspects can stimulate high motivated learning process to develop students' skills. The consideration of the preparation, implementation, and evaluation process of the teaching and learning impacts the students' problem solving skills, critical thinking skills, communication skills, collaboration skills, and information literacy. The teaching through the project-based learning model can be done creatively depending on the learners' and teacher's characters and the learning facilities.

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