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Evaluation of Project-Based Learning: Analysis of Students and the Quality of Learning Products in Higher Education

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Abstract: This study aims to determine whether the implementation of project-based learning elevates product quality and student engagement levels. This study tries to find out the effect of project-based learning on product quality and the student engagement level in the learning process. During the conduct of the study, very few research methods were applied based mainly on observations. Observations were used to find levels of active engagement of students in project-based learning and assess the quality of their work. It would amount to observations conducted during the learning process for determining product quality in student-generated material. These observations would be made by checking the products against pre-designed criteria. The participants in this experiment were learners in classrooms specially reserved for the production of printed instructional materials. The participants in this experiment were the following people. From the findings of this study, it is concluded that project-based learning enhances not only what is learned but also the quality of whatever product is developed and student engagement with learning. An additional plus for project-based learning is that it really is a very effective way toward skill development among students. It further taps into student talent development. The recommendations that can be made to improve the implementation of project-based learning in tertiary institutions and better its effects on the learning by students.

Keywords: Evaluation; Higher Education; Project Based Learning.

Introduction

A learning program is evaluated to determine whether or not it is effective and efficient. This is the process of learning evaluation. To establish whether or not the course is successful, this evaluation will be carried out. Laearning assessment is carried out to assess the extent to which educational efforts are successful (Doyok, 2021; Innayah, 2020) and putting into action the needed steps to be done in order to strengthen the credibility of the educational system. When learning is evaluated, it is done for two reasons: first, it helps with the process of decision-making, and second, it gives the critical feedback that is required to improve the overall quality of learning. The evaluation of learning is a component that is crucial in light of this. The assessment of learning can sort out, rather, where learning assessment is employed specifically to bring out the growth and development made by students within some appropriate period of time (Mubarok et al., 2021; Nasrullah et al., 2021). What has been learned is of great importance since it forms a basis for both the learning process and what is learned. What has been learned is employed to find out what skills the learners have been able to acquire and how successful the teaching was. What has been learned is employed to find out the quality of learning that has taken place and to also access the efficacy of teachers in delivering content. What has been learned has to be determined since it is that feedback which is necessary for the improvement of learning (Abrejo et al., 2022; Agrawal et al., 2021). Evaluations of student performance and ongoing educational quality are also possible. It enables immediate adjustments to optimize learning. The evaluation of learning is a critical procedure while also taking the necessary steps to improve the integrity of the

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educational system (Mystakidis et al., 2019; Valsamis & Sukeik, 2019). Evaluation can be used to determine the level of student mastery of the expected competencies so that universities can make the right decisions about whether students are ready to proceed to the next level or need additional support. In addition, learning evaluation can be used to evaluate the effectiveness of learning programs and teaching methods so that universities can evaluate and change less effective programs.

Project-based learning reveals increasing tendencies of contextual learning and learning based on experience. The reasons are obvious—students can learn to apply their knowledge at work by using project-based learning, which makes students ready to face the world to find a job after they graduate. Besides, through PjBL, students' skills can be improved in collaboration, communication, and problem-solving skills. When students are engaged in the process of learning, it is the responsibility of lecturers to give them appropriate direction as well as constructive comments (Singh, 2019; Utha et al., 2018). Project-based learning is a highly effective instructional approach that enhances student proficiency (Kim, 2021; Situmorang et al., 2022). When project-based learning is being used, students can relate to the education they are being subjected to and complete the assignments fruitfully. This would help students apply classroom knowledge into real-life practice and improve their analytical skills (Nguyen, 2021; Wahid et al., 2020). This, therefore, will make students able to cooperate better in group projects and have their real-life working communication and teamwork skills improved. In higher education institutions, this is a great need because it makes the students learn more proactively and get involved in a more contextualized process of learning. Through project-based learning, students' skill acquisition during the learning process can be evaluated (Goorts, 2020; Made Sudana et al., 2019).

The novelty of this research stems from its comprehensive approach to examining project-based learning in higher education by addressing two interconnected dimensions: student engagement and the quality of learning products. This dual focus is significant because it goes beyond the traditional scope of studies that often analyze these aspects separately. For example, some research may focus solely on how PBL affects student participation and motivation, while others might concentrate only on the tangible outcomes or products resulting from PBL activities. By integrating these dimensions, this study provides a holistic understanding of PBL's impact, highlighting how active student involvement in learning processes contributes directly to the development of high-quality academic products. This dual analysis not only bridges theoretical and practical outcomes but also reveals the interplay between pedagogical strategies and their real-world applications in academic settings.

Assessment is crucial in higher education since it reveals how well project-based learning works and how well students have learnt the skills. This evaluation reveals a lot about the student's development and project performance. This test will help you excel in everything. Schools can better understand classroom instruction, student work, and student growth by using accurate and valid assessment tools. This study will examine how project-based learning improves university education by increasing student engagement and productivity emphasize project-based learning. Project-based learning and student progress evaluation are crucial. Project-based learning assessments evaluate project performance and student improvement (Li et al., 2020; Ngereja et al., 2020). We value project-based learning. Project-based learning and student progress evaluation are essential. Project-based assessments examine student growth and project performance (Chua & Islam, 2021; Morais et al., 2021). This study examines whether project-based learning improves product quality and student involvement. Student participation is encouraged in project-based learning. This strategy requires students to complete lecture assignments actively. This research should reveal whether project-based learning improves final products and engages students in their education.

Method

Subject knowledge is gained by observation in this study. The observation method is a data collection approach that uses direct observation to gain information about the object or subject being studied (Dahlia, 2021; Tyan, 2021). Students' engagement in project-based learning and the quality of their final deliverables are evaluated using observational data. During the learning process, students' work is closely examined and evaluated using established criteria. This research effort focused on students enrolled in courses that emphasized the creation of printed instructional materials. In this study, descriptive statistics and qualitative analysis were used to analyze data gathered from observations. The knowledge was collected through observation. Descriptive statistics can be used not just to explain the quantity of student participation in project-based learning but also to explain the quality of the products generated by students. You could be right about either of those things. All of the observational data could be reviewed in depth using qualitative analysis during this time range. Along with student engagement in project-based learning, descriptive data can also explain the quality of student-made products. We can now evaluate all of the

observational data using qualitative analysis. Figure 1 show the research flow.

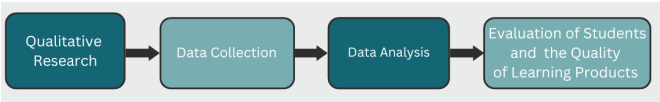

Figure 1. Research flow

Result and Discussion

The observation results indicate that student engagement in learning is relatively high when the project-based learning model is implemented. It may result from the level of student interaction in work groups and the activities of students involved in producing project products. Furthermore, students appear more enthusiastic about engaging in the learning process when contrasted with conventional learning methods. It demonstrates that the project-based learning model can enhance student motivation and engagement in the learning process (Oktarian, 2019; Quiroga et al., 2019). It would seem from the observations that the students are actively participating by offering suggestions and helping to make things for the project. Moreover, students can work together effectively and complete projects on time. This is evident in the polished final products of the projects and the presentations given by the exceptionally talented students. In conclusion, the results of the data analysis show that students' involvement and understanding of the material being taught can be enhanced through project-based learning.

The results of the observations show that the students are enthusiastic about their studies. Their actions make this very evident; they are often asking questions, contributing ideas to group discussions, and helping to develop project items. Also, students were enthusiastic and satisfied with the learning process because it was based on the project model, according to interviews. Even still, some pupils' lack of interest in studying is evident from the observation data. The material understanding test analysis indicates that the average student has a relatively high level of comprehension of the material being taught. It demonstrates that the project-based learning model can enhance students' comprehension of the subject matter (Hiasa & Supadi, 2020; Surahmadi, 2018). However, pupils persist in facing difficulties comprehending the given topic, and the project outcomes fail to satisfy the expected criteria. Improvement can be achieved by providing students with sufficient advice and support. Table 1 shows summarizing the findings on evaluation of project-based learning.

Table 1. Summarizing the findings on evaluation of project-based learning

Aspect	Findings
Student Engagement	• High engagement in Project Based Learning • Active participation in group discussions and project development • Enthusiastic involvement compared to conventional learning methods
Comprehension of Subject Matter	• Average test score exceeded 80%, showing good understanding • Students applied learned concepts well in project products • Some students faced difficulties in comprehending certain topics
Quality of Project Products	• Students produced professional and functional project products • Projects demonstrated originality and creativity • Some projects did not meet the expected quality criteria
Learning Outcomes	• Learning goals were achieved, with students understanding and applying material • Students effectively applied knowledge to project outcomes
Overall Evaluation	• Project-based learning improved student engagement and product quality

The learning process and the project outputs created by students indicate that the learning objectives have been successfully achieved simultaneously. The learning process of the project method exemplifies this, allowing pupils to become more innovative and involved. Notwithstanding this, a few kids continue to exhibit a lack of comprehension. Based on these data, the project-based learning approach appears to have the potential to improve student participation in the learning process and grasp of the subject matter. However, areas of the learning process can be enhanced, such as ensuring that students receive adequate assistance and motivation.

The data analysis findings from the material comprehension assessment indicate that the learning goal has been successfully accomplished. The average result of the students on the test exceeded 80%. It indicates that the students have comprehended the material being taught well. In addition, the outcomes of student-led project product evaluations indicate that students have effectively implemented the concepts acquired during the project product development process. However, pupils persist in facing difficulties comprehending the given topic, and the project outcomes fail to satisfy the expected criteria. The improvement can be achieved by providing students with sufficient advice and support. The learning process and the project outputs created by students indicate that the learning objectives have been successfully achieved simultaneously. The learning process of the project

method exemplifies this, allowing pupils to become more innovative and involved (Mafruudloh & Fitriati, 2020; Wijayanto et al., 2020). Moreover, the results that the students achieve with the project artifacts prove the application of the concepts that should be applied during the development process. However, there is still room for improvement, especially in drawing on additional ways to provide students with adequate direction and help them improve their understanding of course material and achieve great results on projects.

The students achieved a good quality in their project products. The project products developed by the students are executed and presented very professionally. The project products also have the intended functionalities to meet the objectives. However, some products continue, as ever, not meeting the required quality. It could be improved by giving learners adequate support and guidance. Moreover, the output of the project shows very high levels of originality. Learners were very inventive and original when it came to producing project products. Students displayed inventiveness and originality in creating project goods (Norjanah et al., 2018; Siew & Ambo, 2020). However, some items remain less inventive. It can be improved by guiding students and encouraging them to create new and innovative thoughts for project product development. Project product implementation results are also excellent. Students can successfully execute project items. Not all aims are met.

This study suggests that project-based learning can engage students in knowledge acquisition. The literature study suggests that project-based learning can motivate and engage pupils (Dang, 2021; Niron, 2020). The study also suggests learning goals are met. It shows that students understand and apply the material to their project outcomes. Study findings on the project product indicate satisfactory implementation, inventiveness, and quality. Projects indicate students can apply their knowledge. This study suggests that project-based learning may improve learning. This would make the learning process something of interest to the students, where understanding the subject matter will be reflected in the projects to be developed (Nasution et al., 2021; Silitonga, 2018). It requires that lecturers and students work collaboratively by providing the lecturer with the requisite support and cooperation needed to facilitate the teaching/learning process and achieve the best possible learning outcomes for students.

Conclusion

This study discovered that, while employing the project-based learning paradigm, students were considerably more involved than expected throughout the whole learning process. Great illustrations of this are the volume of student-to-student contact that takes place during group projects and the variety of student-initiated activities that result in finished goods. Let's examine both of these instances in more detail. You can see both of these instances. It results that students are more involved in studies than ever, even though a much bigger choice of conventional courses is open to them. The findings of this study state that project-based learning can tremendously enhance student engagement and motivation for learning. From the observational data, making it credible, that students contribute actively while expressing ideas and creating items for the project, one ventures to say that they are engaged in these activities at this point. Also, pupils can work together effectively and then meet the deadlines. The quality in the deliverables of the project was perfect, like in their presentations, proving this a fact. Project-based learning may better learning outcomes for students concerning the competencies taught. It can. Two indicators that prove this are the following: both the percentage of students who successfully complete project deliverables and test results presented after project-based learning has been implemented. Both of these measures are demonstrated in the sentence that comes after this one. Project-based learning helps a student to develop his skills of working in a team, communicating, and solving problems. This can be applied in any field of work in later life. Moreover, project-based learning is applied to make education fun and competitive so that the learner wishes to learn more. Overall, the results of data analysis show that project-based learning can increase student participation, understanding, and learning outcomes of the material being taught.

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Conceptualization: H.D.P, A.S, U.D. Data curation: H.D.P, U.D, C.F.K Funding acquisition: H.D.P., K.K. Methodology: H.D.P, Writing–original draft: H.D.P., A.S., Writing–review & editing: H.D.P., C.F.K.

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Conflicts of Interest
The authors declare no conflict of interest.

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