DEVELOPING CITIZENSHIP ATTITUDES AND SKILLS FOR CIVIL ENGINEERING GRADUATES THROUGH PROBLEM-BASED LEARNING MODEL APPROACH

Pieter Lourens Frans, Maslan Abdin*, Juvrianto Chrissunday Jakob

Politeknik Negeri Ambon, Maluku, Indonesia

*maslanabdin15@gmail.com

Abstrak

Sikap dan keterampilan kewarganegaraan merupakan hal yang krusial dalam menghadapi tantangan dunia kerja. Dengan pendekatan Model Problem-Based Learning *lulusan Teknik Sipil Politeknik Negeri Ambon dapat mengembangkan sikap dan keterampilan secara konkret melalui pengalaman praktis. Dengan demikian, penelitian ini memiliki relevansi yang signifikan untuk mempersiapkan lulusan dalam menghadapi perubahan zaman dan tuntutan dunia kerja yang semakin dinamis. Penelitian menggunakan pendekatan* mixed method *yaitu penggabungan data penelitian kuantitatif dan kualitatif. Hasil penelitian yang didapat yaitu dari 19 mahasiswa yang mengikuti pembelajaran nilai rata-rata (Mean) hasil belajar mahasiswa pada variabel sikap sebesar 3,47 selanjutnya variabel keterampilan sebesar 3,53. pembelajaran dengan pendekatan model* project based learning *menunjukkan dampak positif dengan penilaian baik dan baik sekali, pada sikap mahasiswa mampu menggagas alternatif solusi, kontribusi dan menunjukkan integritas. Pada keterampilan mahasiswa mampu membangun jejaring merefleksikan hal-hal selama proses, memiliki semangat untuk terus memperbaiki lebih baik, mengimplementasikan solusi dan memiliki inisiatif untuk perbaikan bersama.*

Kata kunci: kewarganegaraan digital; pojok baca digital; pengembangan

Abstract

Having the right attitudes and skill related to citizenship is essential when it comes to dealing with the problems of the professional sphere. The Problem-Based Learning Model enables Civil Engineering graduates from Politeknik Negeri Ambon to cultivate tangible attitudes and skill via hands-on experience. Therefore, this research holds great importance in equipping graduates to confront the evolving circumstances and the progressively dynamic requirements of the professional sphere. The study employed a hybrid methodological approach, specifically integrating both quantitative and qualitative research data. The research findings were derived from a sample of 19 participants who participated in the study. The mean value of student learning outcomes for the attitude variable was 3.47, while for the skill variable it was 3.53. Implementing a project-based learning paradigm has been found to have a favourable effect on students' attitudes, as evidenced by their ability to provide innovative ideas, actively contribute, and demonstrate integrity, leading to positive assessments. Regarding talents, students possess the ability to establish connections, engage in reflective thinking, have a persistent drive for self-improvement, effectively execute solutions, and exhibit proactive behaviour towards mutual enhancement.

Keywords: problem-based learning; attitudes; skill

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INTRODUCTION

The study conducted by Attalina (2020) offers an elucidation of the project-based learning model as an educational approach in which students engage in problem-solving activities, allowing them to showcase their talents and ultimately enhance their learning outcomes. In addition, the learning process of the project-based learning paradigm entails students undertaking projects, either alone or in groups, to create tangible outcomes that will subsequently be evaluated.

In addition, Erisa, Hadiyanti, & Saptoro (2021) elucidated in her study that the project-based learning approach fosters a heightened sense of discipline, engagement, and creativity among students during the learning process. In addition, utilizing the project-based learning paradigm offers students the opportunity to get a valuable learning experience. The project-based learning model serves as a valuable and significant tool, as it effectively connects students with problem-solving opportunities, while also placing them at the center of the learning process and enabling them to generate tangible outcomes through their project work.

Consistent with the aforementioned viewpoint, Yulianto, Fatchan, & Asnita (2017) assert that project-based learning is an instructional approach that involves assigning learning tasks tailored to complex problems. Subsequently, students are tasked with engaging in investigative learning pertaining to the problems, which are solved collaboratively in groups. In addition, the project-based learning model offers students significant opportunities to engage in active learning by encouraging them to ask questions, investigate, and effectively communicate and collaborate on complex problems that are transformed into projects. Consequently, students are required to assume responsibility for the outcomes they produce.

As stated by Mulyasa in 2014, the project based learning model consists of four stages: (1) assigning projects or tasks to students, (2) creating project plans, (3) establishing a schedule for project implementation, and (4) monitoring project activities to assess progress (Mulyasa, 2014). Moreover, as stated by Yulianto, Fatchan, & Asnita (2017), the learning process of Project Based Learning involves the following steps: (1) identifying fundamental inquiries; (2) developing project designs; (3) organizing schedules; (4) monitoring project advancement; (5) evaluating the outcomes; (6) assessing the whole experience.

Lestari (2016) outlined six steps of PBL in a reasearch: 1) Initiating the lesson with a thought-provoking question, 2) Formulating a project plan, 3) Creating an activity schedule, 4) Monitoring the project's progress, 5) Evaluating the produced outcomes, and 6) Conducting an assessment. The learning steps in the Project Based Learning model can be summarized as follows: a) Exploring and empathizing with the issue/problem, b) Formulating the root cause of the selected issue, c) Exploring and formulating alternative solutions to the selected issue, d) Creating an intervention design for the selected issue, e) Implementing the intervention in the community, f) Presenting the activity results through a presentation, g) Reflecting on the learning experience..

The learning process utilizing the project-based learning model entails achieving not only the project's output, but also the desired outcome, which encompasses the development of character traits and skills necessary for successfully completing the project. Consistent with the viewpoint expressed by Patuti, Adhani, & Yunus (2023).

Within his work, he elucidates an instance of the demeanor that is necessary to adopt when doing a project, namely a cooperative demeanor. According to his writing, he emphasizes the significance of fostering positive changes in pupils' mindsets. Moreover, Abdin, Langi, & Wattimena (2022) elucidated that the Project based learning approach entails students engaging in problem-solving activities and showcasing their skills, while also fostering a sense of responsibility, discipline, and effective communication in relation to the projects they are undertaking. In his study, Mutaqin (2015) discovered that using a project-based learning model can foster the development of students' character values and enhance their soft skills.

Numerous research have investigated the implementation of project-based learning, revealing variations in both the geographical settings and the desired outcomes. In addition, the researchers have conducted research that provides updates in the field of development, specifically focusing on citizenship education courses in vocational education and the regional characteristics and goods created by students affiliated with the civil engineering department. Moreover, researchers can affirm that the effective outcome of this research would undoubtedly establish it as a benchmark for the advancement of project-based learning in citizenship education courses at Politeknik Negeri Ambon.

Centered on enhancing the curriculum during the period of industrial revolution 4.0. The character learning achievements in the Civil Engineering department of Politeknik Negeri Ambon are defined by ten topics, as outlined by Abdin, Langi, & Wattimena (2022). These topics are mandatory for students in the department and are described as follows: 1) Holds a strong belief in God and demonstrates a devout religious demeanor; 2) Promotes human values in endeavors rooted in religion, morality, and ethics; 3) Promotes the enhancement of societal, national, and state well-being through the implementation of Pancasila; 4) Exhibits pride and love for their country, displaying nationalism and a sense of responsibility towards their nation; and 5) Embraces a nationalistic identity and harbors deep affection for their country. 6). Display cooperation, social sensitivity, and a conscientiousness towards society and the environment; 7). Take into account academic principles, standards, and ethics; 8). Exhibit an autonomous and responsible approach towards their work in their own sector. 9) Exhibit a conscientious approach towards autonomous work within their area of specialization and 10) uphold the principles of entrepreneurship, self-reliance, and perseverance.

The of Politeknik Negeri Ambon offers a citizenship education course as part of the curriculum for civil engineering students. This course is designed to develop the character of students by focusing on the objectives of citizenship education, as outlined by Bhughe (2022) and Jakob (2018). According to Bhughe, the vision of citizenship education is to foster an educational process that cultivates the intelligence, participation, and responsibility of each student, ultimately shaping them into well-rounded citizens. In addition, as stated by Kabatiah, (2021). Citizenship education courses aim to provide the future generation with sufficient information, skills, and practical experience to ensure that every student is competent and effective in responding to different situations. The explanation suggests that citizenship education courses play a role in shaping the character of students by influencing their attitudes and skills. Therefore, employing the appropriate model approach can effectively instill the desired character traits. According to the study, one of the models is the Project-Based Learning model approach.

RESEARCH METHOD

The researchers employed a progressive mixed methodology to integrate the acquired research data. According to Creswell (2016), mixed research methods are employed when research data includes both quantitative and qualitative data. The integration of these two data kinds yields a more holistic comprehension of the research subject. The research utilises qualitative data, specifically focusing on the learning process through the implementation of a project-based learning strategy. Moreover, quantitative data refers to learning outcomes that are expressed in numerical form. Data collecting techniques are conducted through two methods, the first being a qualitative technique wherein the interviewer employs an interview guide or questionnaire consisting of a list of questions, but not in the form of fixed (mandatory) sentences. Secondly, the collection of quantitative data will be achieved through the administration of questionnaires to the research sample. The data analysis approach employs a method called gradual mixed data analysis, which involves integrating quantitative and qualitative data to conduct comparisons and subsequently interpret or elucidate convergence/divergence.

RESULTS AND DISCUSSION

Only one class of Civil Engineering students from Politeknik Negeri Ambon participated in this research. The objective of this study is to cultivate moral qualities through the implementation of citizenship education programmes. This investment initiative employs a project-based learning methodology, which distinguishes itself from past approaches by emphasising the use of the skills and knowledge of Civil Engineering students to address community issues.

Procedure Employing Project Based Learning Model Approach

The implementation process involves several steps. Firstly, students engage in exploration and empathy to understand the issues and problems at hand. This entails conducting surveys and direct observations in the community or partner environment. The results obtained are then documented and used as discussion material in class. The objective is to make informed decisions about the problems that will be addressed in learning projects, prioritising those that have the greatest impact on the community or partners.

Figure 1. The Students Engaged in the Process of Investigating and Understanding Difficulties or Problems by Physically Visiting Partners and Documenting the Challenges They Come Across.
Source: Research Documentation, 2023

Secondly, students identify the underlying factors contributing to the chosen concerns. This process allows students to develop effective strategies to address the community/partners' needs. In this study, we observed coastal communities that regularly face challenges with weather conditions, leading to the occurrence of significant tidal waves. These waves have a detrimental impact, causing beach erosion and sedimentation, which are considered coastal disasters. As a result, the community suffers losses and the coastal areas, including riparian dams, are damaged. The proximity of coastal houses to the tidal waves poses a significant threat to local inhabitants. It is imperative to address and prioritise this phenomena to prevent further erosion and minimise its detrimental effects.

Thirdly, the chosen approach involves exploring and devising alternative solutions to address the identified problem. The proposed solution entails implementing a project to plan embankments and plant mangroves. In this project, students will design and construct new embankments with different specifications from the existing ones. These designs will adhere to established standards and regulations aimed at mitigating erosion, which could have detrimental effects on the coastal environment. Additionally, the project aims to protect residential areas near the beach by preventing sea waves from reaching them. In addition to creating a secure talud design, students also develop a cost budget plan, incorporating the guidelines outlined in PUPR Ministerial Decree No. 1 of 2022 and utilising unit values based on the Basic price for semester II 2022 in Maluku province. In addition, students partnered with Raharja Services to contribute 300 mangrove tree saplings in their efforts to manage mangroves.

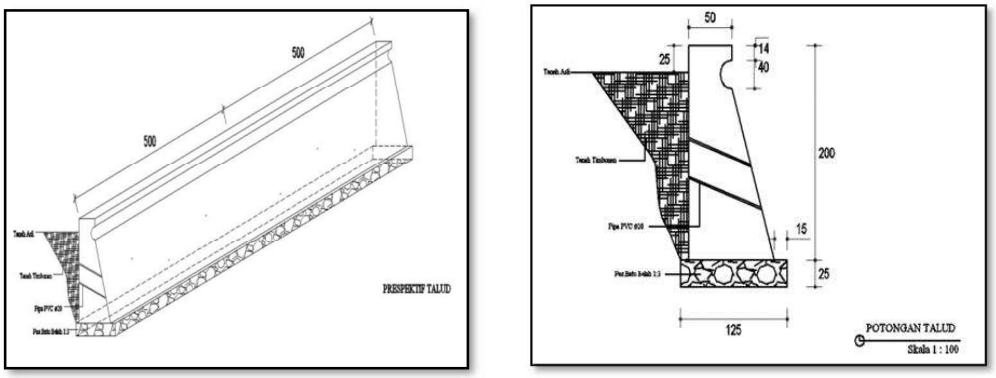

Figure 2. The Initial Solution Image Depicts a Slope Planning Design that is Specifically Customized to Meet the Requirements of Partners and the Specific Location of the Activity.
Source: Students' Design, 2023


Figure 3. The Second Approach Involves the Handover of Mangroves from Jasa Raharja to Politeknik Negeri Ambon Lecturers, Followed by a Joint Effort of Students and Lecturers to Plant the Mangroves.

Source: Students' Documentation, 2023

Then, execute initiatives within the community. During this activity, students establish a theme centred around visionary, productive, and socially conscious students. This is achieved through the opening prayer, rendition of the national anthem "Indonesia Raya," and remarks delivered by supervisors and partners. Following that, there will be a presentation on talud planning and the filing of planning paperwork. Subsequently, the students, along with their partners or community members, will engage in collaborative mangrove planting activities along the coastline.


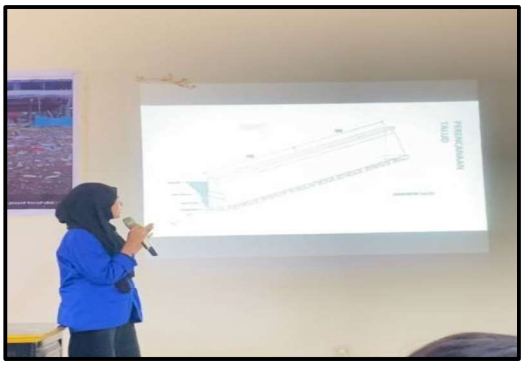

Figure 3. Utilization of Project Based Learning Model Approach for Showcasing Product Photos and Delivering Educational Materials..

Source: Students' Documentation, 2023

Analysing the Data on the Implementation of Learning Utilising Project Based Learning Model Approach

The scoring of data based on responses to questions in the research questionnaire was conducted upon the conclusion of the series of activities. The data collection was conducted by collecting assessment data on questionnaire questions from 19 students, focusing on the factors of attitudes, talents, and the societal impact of the items created by the students. The data was grouped using the Excel software tool and subsequently analysed using SPSS Version 26. The statistical findings are presented in the subsequent table:

Table 1. Attitude and Skill Statistics

		Attitude	Skills
N	Valid	19	19
	Missing	0	0
Mean		3.47	3.53
Median		3.00	4.00
Mode		3	4
Deviation Standard		0.513	0.513

Source: Research Results, 2024

The statistical output table above presents the N value, which indicates that there are 19 valid respondent data from students who engage in learning activities utilising a project-based learning model approach. In addition, there is no missing data, indicating that all data was processed using SPSS Version 26. The mean value of student learning outcomes for the attitude variable is 3.47, while for the skills variable it is 3.53. The median attitude score is 3.00, whereas the skill score is 4.00. The modal values frequently observed in the questionnaire assessment are 3 and 4. Following in the standard sequence. The deviation indicates that both the attitude and skill variables have an identical value of 0.513.

In order to ascertain the anticipated mean, Ghozali (2016) viewpoint, as cited on the Binus University website, offers a comprehensive overview of the distribution of each individual observation component. As per Sekaran and Bougie (2016), the standard deviation is a statistical measure used to assess the dispersion of data within a sample and indicates the proximity of the data points to the mean value. It is clarified that a high standard deviation value signifies greater variability or inaccuracy compared to the mean, whereas a low standard deviation value implies similarity or accuracy to the mean. The research findings indicate that the statistical table above demonstrates that the hypothesis employed in this study yields data that is comparable or accurate to the mean. The attitude and skill variables have a standard deviation of 0.513. The average value for the attitude variable is 3.47, while the average value for the competence variable is 3.53. The objective of this study is to evaluate students' attitudes and skill in

learning using a project-based learning approach. The procedure is delineated as follows;

1. Student Attitudes Towards Learning when Utilising Project-Based Learning Methodology

The attitude variable requires students to demonstrate the competency of generating alternative solution choices for the selected social issue by active participation, contribution, and adherence to legal requirements. With the use of learning achievement indicators, one of the indications is the ability to generate alternative solutions. (2) Showcase one's contribution and function within the organisation, (3) Exhibit integrity. The acquired results are presented in the following table:

Table 2. Students' Attitude

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	10	52.6	52.6	52.6
	Very Good	9	47.4	47.4	100.0
	Total	19	100.0	100.0	

Source: Research Results, 2024

The table above demonstrates that the utilisation of a project-based learning strategy yields positive student attitudes, with 10 students showing an excellent frequency and 9 students showing a very good frequency. These statistics demonstrate that this strategy has the capability to enhance student attitudes. As on Hastawan's research in 2023, the implementation of the project-based learning model in pupils promotes positive attitudes such as cooperation, discipline, tolerance, and self-confidence. Putra (2013) states that the project based learning model promotes students' innovative attitudes, whereas Banjarnahor (2021) suggests that the project based learning model aims to cultivate student attitudes.

The data and explanation provided above are supported by field data, which demonstrates that students display their attitude towards completing the project they are working on. Specifically, students are taking the initiative to propose alternative solutions, such as planning embankments and planting mangroves. Furthermore, each student demonstrates their contribution and role within the group by dividing tasks and actively participating in the project's implementation. Students demonstrate integrity by actively delivering the things they have created, specifically talud planning documents, and engaging in tangible efforts with the community, such as planting mangrove plants in Tawiri region, Ambon City.

2. Student proficiency in acquiring knowledge through the utilisation of project-based learning methodology

The skills variable encompasses the ability to collaborate effectively in teams, establish professional networks, and engage in ongoing learning for the purpose of implementing solutions to issues through the execution of independent, high-caliber, and quantifiable social projects. The evaluated indicators encompass the ability to collaborate effectively within a team, establish connections, engage in reflective

thinking and learning, demonstrate a persistent drive for improvement, successfully implement problem-solving solutions, and exhibit a proactive attitude towards collective growth.

Table 3. Students' Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	9	47.4	47.4	47.4
	Very Good	10	52.6	52.6	100.0
	Total	19	100.0	100.0	

Source: Research results, 2024

The table above shows that project-based learning is able to improve student skills with a frequency of both 9 and 10 students. These findings demonstrate that this methodology effectively enhances pupils' proficiency. Cahyono, et al, (2022) suggest that project-based learning can enhance the proficiency in articulating viewpoints. Sholeha, S. et al (2021) enhancing and refining cognitive skill related to critical thinking. The study conducted by Lufri, Elmanazifa, & Anhar (2021) has the potential to enhance students' proficiency in communication. Nafiah & Suyanto (2014), project-based learning involves practical exposure to real-world scenarios in order to develop critical thinking and problem-solving skill. Ardyanto, Koeswati, & Giarti (2018), a suitable approach for acquiring critical thinking skill is to employ a project-based learning model.

The aforementioned data and explanation is corroborated by field data indicating that pupils possess the ability to exhibit proficiency in project completion. From a character standpoint, students possess the ability to engage in community collaboration. The projects they produce demonstrate effective collaboration among their peers, as well as the establishment of networks throughout their processes. This is achieved through coordination with various parties, such as the Ambon City Raharja Service and the village government. The project encountered numerous challenges during its implementation, however, the students managed to derive valuable insights from each stage, ultimately ensuring the successful completion of the project. The solutions implemented in their initiatives had a significant influence on the community and partners. They achieved this by submitting comprehensive slope planning documents and engaging in the planting of mangrove trees. These actions were undertaken with a strong sense of responsibility and excitement, aiming for mutual enhancement.

CONCLUTION

The implementation of the project-based learning model yields favourable outcomes in terms of attitudes and skills. Students demonstrate the ability to generate innovative solutions, actively contribute to group work, and exhibit integrity, resulting in positive assessments. Within the domain of skills, students possess the ability to establish networks during the process, engage in reflective thinking about new concepts and acquired knowledge, demonstrate a keen desire for ongoing improvement, effectively

apply problem-solving strategies, and exhibit proactive initiative towards collective enhancement.

The utilisation of a project-based learning strategy significantly impacts student attitudes and competencies. The mean value of student learning outcomes for the attitude variable is 3.47, while for the skills variable it is 3.53. Among the pupils, 10 have been rated as good and 9 as very good in terms of their attitude. Additionally, 9 students have been rated as good, and 10 kids possess commendable student skills. The data demonstrates that the implementation of the project-based learning model effectively enhances the attitudes and skills of students enrolled in the Civil Engineering Department of Politeknik Negeri Ambon.

The utilisation of the project-based learning paradigm is pertinent in enhancing students' attitudes and aptitudes to address societal challenges. Hence, when implementing problem-solving, it is crucial to take into account the necessity for engaging and pertinent tasks, the provision of support in problem-solving, and the organisation of project groups based on their scope. There are currently 5-7 students who utilise available resources, such as professors, the community, and the government, to solve problems.

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