

The Influence Of Maritime Education Through Project Based Learning-A Review

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Abstract. Indonesia is a maritime country that aspires to become the world's maritime axis, therefore it requires responsive human resources in managing maritime resources. Maritime education is important in order to achieve these goals. Maritime education is a planning effort in shaping the character and maritime spirit of Indonesia's young generation. Through project-based learning in its integration in the context of maritime education, it can have a positive influence such as increasing science process skills, increasing learning activities and proficiency, improving the quality of collaboration skills and can improve the learning experience. The purpose of this research is to evaluate how the project-based learning paradigm affects the development of maritime education. This research uses *Literature Study* method in collecting relevant data for this research. The result of this literature review is how the influence of maritime education through project-based learning among students. Thus, it is expected that students are able to provide positive results through project-based learning on maritime education.

1 Introduction

The goal of maritime education is to supplement the current general education marine curriculum. The goal of marine education is to raise public awareness of maritime nations. The goal of marine education in Indonesia's national development is to make the country proud to be a nautical nation [1].

Because education offers the knowledge required to handle maritime concerns, such as the creation of maritime industries and the application of management systems, among other topics, maritime communities rely on education to survive. Maritime issues and the maritime culture that characterises Indonesia are major currents in the country's current progress. To rebuild national maritime affairs and create Indonesians who are high achievers, competitive, and endowed with local wisdom, maritime education programmes that incorporate a greater amount of scientific content, nautical skills, and a distinctive maritime culture are necessary [2].

Maritime education has become an important axis in forming the next generation who is able to respond to the demands and complexity of the maritime and fisheries sector. In an era of rapid change and rapid technological development, the success of maritime education is not only measured by the theoretical knowledge that students have, but also their ability to apply these concepts in real situations.

Project-based learning is one kind of instruction that has attracted a lot of interest. With project-based learning, students and their schools use technologies that they are familiar with in their daily lives to enhance their learning experience. Students who use this kind of learning approach participate actively in their education and receive more engaging and meaningful instruction [3]. Learners are empowered to be actively involved in practical projects that reflect everyday challenges, for example in the maritime world.

This review of the literature attempts to provide specifics of how project-based learning in maritime education affects students' knowledge, abilities, and attitudes. This article aims to provide an in-depth literature analysis of current research that illustrate the difficulties and achievements associated with implementing project-based learning in maritime education settings. In order to better prepare students for the dynamics of the maritime industrial complex, this article will examine how this learning method can enhance students' learning experiences by concentrating on the findings of prior research. With any luck, this review of the literature will provide a complete picture of how project-based learning benefits maritime education and offer guidance for future study on how to better include students in real-world situations that are pertinent to the demands.

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2 Research Method

Research method is a systematic literature review. Systematic literature review is a research methodology or specific research and development carried out to collect and evaluate research related to a particular topic focus [4]. Defenition of systematic literature review is defined as a research method for conducting literature reviews in an orderly way mapping certain phases [5]. The aim of a systematic literature review is to prepare a comprehensive and objective synthesis of existing literature in a particular field of study, identify research gaps, and produce valid and reliable evidence. The stages in this systematic literature review consist of the planning phase, conducting the review phase, and reporting the results.

3 Results and Discussion

The study's findings are presented using the SLR method and are derived from an analysis of publications concerning project-based learning in maritime education. Finding out how applying the project-based learning model affects maritime education can be done by drawing conclusions from the data. influence in elementary, middle, and high school education. Below are presented the results of the researcher's review of several research articles related to the topic raised.

Table 1. Analysis of project-based learning at primary school level

No.	Title	Research Result	Researcher and Year
1.	SDN 250 Sinar Gading II has conducted project-based learning through an evaluation model, namely CIPP (Context, Input, Process, and Product) , which is an evaluation methodology centered on thresholds or success rates (Movitaria, 2022). According to Stufflebeam (2008), a decision-oriented and structured evaluation can determine the appropriate action to use or implement a particular project.	The evaluation results of the project-based learning that SDN 250 Sinar Gading has implemented indicate that, on average, the results are satisfactory, with 84% to 89% of students achieving very good learning outcomes.	[6]
2.	SDN 2 Joanyar has conducted project-based learning posttest in the control class and experimental class, namely random sampling.	The findings of this study provide evidence for the hypothesis, which states that there is a significant difference between students who learn using a project-based learning model and students who do not. This is impacted by a number of factors, including students being more engaged in the learning process, fostering student interaction, and being able to raise student involvement in order to make the material stick in their memories.	[7]
3.	SDN 8 Banyuning has conducted project-based learning through pseudo-experiments.	Students studying science had higher experiential learning scores than students in the control group. Furthermore, it can be argued that project-based learning is superior to traditional educational models.	[8]

When evaluated in light of the three schools' excellent project-based learning outcomes, student learning outcomes are increased. When students participate actively in their education, they have the opportunity to rely on their prior knowledge when interacting with other students in different groups. Additionally, when students work on projects, it enhances their scientific abilities. Because students will gain experience through their own activities, this method also improves student learning outcomes, leading to more meaningful learning.

Table 2. Analysis of project-based learning at junior high school level

NO.	Title	Research result	Source
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1.	SMPN 3 Sukasada has conducted project-based learning through experimentation by applying cluster random sampling technique.	Based on the findings of the trial conducted between the two classes that used STAD cooperative learning and project-based learning. and the pretest results attained by the class with the highest score that uses project-based learning.	[9]
2.	Muhamadiyah 6 Palembang Junior High School has conducted project-based learning through filling out observation sheets, questionnaires and experimental test results.	Based on the analysis of the data, a portion of the students' science process skills on the test and observation sheets fall into the "good" category. By involving students in independent observation, the project-based learning model has the effect of helping students develop their science process skills.	[10]
3.	SMPN 3 Sidemen has implemented project-based learning by conducting a pseudo-experiment through a post test only control group design.	The class that used MPBP learning received the highest score on the test results from the comparison of the classes. This indicates that students who learn using a project-based learning model differ from those who learn using a traditional learning approach in their capacity to solve common science problems.	[11]

It can be concluded from the three schools' results that junior high school project-based learning enhances student learning outcomes. The findings of the literature review demonstrate that students taught with project-based learning models have higher levels of creativity than students taught with traditional learning models. Consequently, one effective way to increase students' learning potential is through project-based learning.

Table 3. Analysis of project-based learning at high school level

NO.	Title	Research result	Source
1.	In this journal, project based learning is applied to high school students, namely in the project of making miniature ecosystems to find out how ecology learning outcomes in high school students with the research subject of SMA Negeri 1 Mijen students.	The use of project-based learning in high school to create miniature ecosystems demonstrates that, from an affective perspective, there is no discernible impact. However, project-based learning for creating miniature ecosystems has a significant and effective effect on optimising students' cognitive and psychomotor learning outcomes when considered in terms of their learning outcomes.	[12]
2.	The journal describes the project-based learning model applied to environmental pollution material to improve STEM literacy environmental pollution material to improve STEM literacy of high school students with the research subject of SMAN 1 Cigombong students.	The application can help students understand the value of STEM literacy and develop scientific inquiry skills, problem-solving abilities, the capacity to design tools, collaborate, and communicate information—all of which will help shape the next generation of workers and make them competitive in the workplace. These findings are based on research on the application of project-based learning model on environmental pollution learning materials.	[13]
3.	Project based learning model was applied in order to improve student's skills in solving problems on the concept of Newton's Gravity at MA Negeri Babakan Lebaksu Tegal.	Project-Based Learning, or PBL, can help students learn how to solve problems and build their emotional intelligence while also helping them comprehend and apply the concepts they have learned in real-world situations, according to the researcher's observations.	[14]

It describes how project-based learning is implemented in elementary, middle, and high schools based on the findings of a review of the literature that has already been published. As demonstrated by improved student learning outcomes in terms of students' cognitive and psychomotor skills, scientific inquiry skills, problem solving skills, collaboration,

communication, and the capacity to design a tool as a problem solving solution, the review's findings indicate that project-based learning benefits students.

Table 4. Maritime education in school

No.	Title	Research result	Source
1.	Analysis of the Potential of the Tuban Center Mangrove Ecosystem as an Educational Learning Resource Deep Marine Environment Social Studies Learning	Centre Mangrove Tuban has the potential to be used as a social studies learning environment with educational resources. Making use of the Tuban Mangrove Centre ecosystem's potential can also help students learn more about the connections between social characteristics, geographic features, and natural resources.	[15]
2.	Development of English learning syllabus on ecotourism perspective in a tourist based english village sawai central maluku	The creation of an ecotourism-focused English language learning curriculum in Sawai English Village, Maluku Middle, is highly pertinent to the local tourism landscape. The needs of the teachers and students in the English village have been considered in the development of the syllabus.	[16]
3.	Rammang Ecotourism-Rammang as a Laboratory Learning Contextual Geography in Maros Regency	The Rammang Ecotourism Area in Maros Regency presents a highly promising opportunity for serving as a geographic contextual learning laboratory. Students' comprehension of geography concepts can be enhanced by using natural laboratories in the classroom.	[17]
4.	Mangrove Ecotourism Utilization Program As A Means Of Environmental Education Through Nature Schools At SMPN 4 Panarukan Situbondo, East Java	Students' awareness of the environment and the mangrove ecosystem can be raised by incorporating mangrove ecotourism knowledge into nature schools' educational activities. This is especially true for female students.	[18]
5.	Concept and Implementation Ecotourism Development in the World of Education	When it comes to raising tourists' awareness and concern for the preservation of the environment and natural resources, interpretation plays a crucial role in ecotourism activities. Human resources can become an agent of change that supports conservation efforts with the right training and interpretation.	[19]
6.	Exploring conservation education and learning activities in Bajulmati Sea Turtle Conservation area	Initiatives to conserve and educate sea turtles Environment carried out by Bajulmati Sea Turtle Conservation (BSTC) in the Bajulmati Sea Turtle Conservation Area on South Malang Beach has succeeded in increasing awareness and knowledge Environment local people and tourists about conditions ecology of Bajulmati Beach.	[20]
7.	Development of Observation Guide Field in Wonorejo Mangrove Ecotourism to Improve Student Learning Outcomes on the Subject of Analyzing the Relationship Between Humans and the Environment as a Result of Hydrosphere Dynamics in Class X IPS 2 SMA Negeri 16 Surabaya	A. Manual Both media experts and content experts deemed the field developed for observation at the Wonorejo Mangrove Ecotourism (EMW) feasible; their respective percentages of eligibility were 76.25% and 96.37%. B. Following field observations in EMW, class student experiments conducted in the field produced better learning results than those of the control class, which did not conduct any fieldwork. C. Students' motivation and enthusiasm for learning can be increased by learning outside of the classroom through activities like field observations in EMW.	[21]
8.	Development of tourism geography teaching material supplement on ecotourism potential material in the Tomini Bay Area	This demonstrates that the instructional material supplement satisfies the requirements of being highly practicable and applicable to the activity lectures process.	[15]

Table 4 shows that integrating ecotourism with project-based learning can result in practical learning opportunities, benefit the environment, and actively engage students in conservation efforts. Ecotourism can be a powerful tool for

creating a generation of environmentally conscious individuals who recognise the value of preserving biodiversity and ecosystem sustainability through the use of project-based learning.

As a maritime nation, Indonesia must embrace maritime education since it will impact the country's national maritime development, which the current administration is advancing in the direction of Indonesia's goals as a global maritime axis nation. In order to achieve maritime development, it is imperative that students receive a systematic education in schools in order to develop strong maritime literacy [23]. Because it will impact the calibre of student understanding, the significance of maritime education aligns with that of the applied learning model.

The aforementioned literature review's findings demonstrate how well project-based learning can be implemented in teaching at the elementary, junior, and senior high school educational levels. This is due to the fact that project-based learning gives students engaging educational experiences, enhances cognitive, affective, and psychomotor learning outcomes, and helps students develop a variety of skills, including problem-solving, collaboration, and communication, as well as the creation of a problem-solving tool that can be used in daily life.

Because project-based learning produces high-quality human resources and can manage resources in a maritime environment, it can be applied in the field of maritime education. This is because the learning methodology used in project-based learning enables students to organise and carry out projects cooperatively [24]. When solving problems during learning, this encourages critical and creative thinking in the students. The project-based learning model is an effective way to incorporate maritime education into elementary and high school curricula. It can offer students authentic and engaged learning opportunities, resulting in high-quality learning that advances maritime education. Project-based integrative thematic learning, which is one of the options available to the government for implementing maritime education in schools to prepare students with maritime culture, is an illustration of the application of project-based learning. This is due to the learning model's exceptional ability to apply the fundamental ideas of contextual, dynamic, inventive, creative, and enjoyable learning [25]. The foundation of Indonesia's golden generation 2045, which will be able to establish Indonesia as the global maritime axis, is this maritime culture.

4 Conclusion

In elementary through secondary education, the project-based learning model has a positive effect on the learning process. The improvement in cognitive, affective, and psychomotor domains as well as the development of a variety of skills throughout the learning process are indicators of this. As a result, project-based learning may be used as a substitute to advance Indonesian maritime education. The development of maritime education is crucial because it provides the government with a means of achieving its goals of having a high-quality human resource base capable of serving as a maritime axis.

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