

TEAM-BASED PROJECT LEARNING METHODS TO PREPARE STUDENTS TO FACE THE CHALLENGES OF THE WORLD OF WORK: A LITERATURE REVIEW OF CONCEPTS AND PRACTICES

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Abstract

Team-Based Project Learning Methods (TBP) have become a major focus in advancing education, especially in integrating STEM (Science, Technology, Engineering, and Mathematics) disciplines. Previous research shows that the TBP method can improve students' critical thinking skills and problem-solving abilities, which are important in facing the challenges of the 21st century. However, the success of this method depends on the integration of relevant 21st-century skills in the curriculum. This article explores the current literature on TBP, highlighting a variety of contexts and disciplines. The results show that the TBP method is effective in developing contextual, collaborative skills, and is relevant to current job market needs. In conclusion, a deep understanding of TBP is essential for educational practitioners in designing effective learning strategies to prepare students to face the demands of the 21st century.

Keywords: Team Based Projects, World of Work Challenges, Concepts, Practices.

INTRODUCTION

Team-Based Project Methods have been widely used, to encourage collaborative learning and improve students' problem-solving skills. Project-based learning, especially when integrated with STEM (Science, Technology, Engineering, and Mathematics) disciplines, as in the case of project-based integrated STEM (PjBL-STEM), has been shown to improve critical thinking skills, which are closely related to critical thinking skills. related to problem-solving abilities (Wahdah et al., 2023; Mirshad et al., 2023).

This is reinforced by research that shows project-based learning can improve students' critical thinking skills, which is a fundamental component in effective problem-solving (Berliana et al., 2023). Interestingly, although the focus of this research is on critical thinking, the skills developed through project-based learning—such as the ability to analyze, evaluate, and synthesize information—are inherently related to problem-solving.

The active participation and engagement required in project-based learning fosters an environment where students can face challenges with creative solutions, thereby improving their problem-solving skills (Berliana et al., 2023; Erianjoni et al., 2023).

This is due to the active and hands-on nature of project-based learning, which encourages the development of critical thinking skills essential for effective problem-solving. This research supports the conclusion that such educational strategies can provide better problem-solving outcomes for students (Wahdah et al., 2023; Yanto et al., 2024).

The use of Team-Based Project Methods in the 4.0 era is very important to prepare students to enter the world of work, where collaboration and teamwork are important skills. These methods align with educational strategies that aim to equip students with relevant 21st-century skills, as they encourage collaboration, problem-solving, and technical competencies that are essential in the modern job market (Kim et al., 2019; Suyuthie et al., 2024).

The integration of these methods into the curriculum is a response to the growing demands of employers seeking candidates with a mix of technical and soft skills, which are increasingly important in the 4IR context (Fomunyam, 2020; Qatyan & Rahim, 2022). However, the success of this method depends on the extent to which the educational curriculum is designed to incorporate the necessary 4IR skills.

Educational institutions must review and adapt their programs to ensure that students are not only proficient in collaborative projects but also equipped with the digital and soft skills demanded by 4IR (Fomunyam, 2020; Kim et al., 2019).

Previous research shows that the Team-Based Project Method has a positive impact on students' academic achievement and learning motivation. The study by Al-Bahadli et al. (2023) found that project-based learning in the context of online second language (L2) acquisition had a positive effect on students' communication, engagement, motivation, and academic performance (Al-Bahadli et al., 2023).

Similar results were found by Shafqat & Habib (2022) in the context of team-based learning in a chemistry course, which showed a significant increase in students' motivation and academic performance (Shafqat & Habib, 2022). Shin (2018) also supports this view by showing that project-based learning can increase students' motivation and self-efficacy, as well as improve their cooperative skills (Shin, 2018).

Although research confirms the positive impact of Team-Based Project Methods on learning motivation and academic achievement, it is important to note that the effectiveness of these methods can vary depending on the context and subject matter. These findings are consistent across subjects and educational contexts. However, there is still a lack of research regarding the effectiveness of these methods in improving 21st-century skills. This study aimed to further investigate the effectiveness of the Team-Based Project Method (TBP) in promoting 21st-century skills. By deepening understanding of the impact of this method, it is hoped that this research can provide valuable insights for educational practitioners in developing more effective learning strategies to prepare students to face the demands of the 21st century.

METHOD

This research uses a literature review method involving seven steps. First, identify relevant databases and information sources such as PubMed, Google Scholar, and educational journals. Second, do a literature search using keywords that match the research topic. Third, the selection of relevant literature is based on inclusion and exclusion criteria. Fourth, conduct an analysis and create a synopsis of the selected literature to highlight the main findings. Fifth, identify research gaps that have not been covered in the literature. Sixth, organize the literature review with a systematic structure, starting from the introduction to identifying research gaps. Finally, make revisions and updates according to the feedback received to ensure consistency and accuracy of information.

RESULTS AND DISCUSSION

Literature Review

Team Based Project (TBP)

TBP is a learning method that uses projects/activities to solve real and complex problems (Nurpratiwi et al., 2022). Students carry out exploration, assessment, interpretation, synthesis, and information to produce various forms of learning outcomes. Project-based learning is a learning method that uses problems as the first step in collecting and integrating new knowledge based on experience in real activities (Baser et al., 2017).

TBP is a learning method where students gain knowledge and skills by doing something that is authentic, engaging, complex, problem-based, and/or challenging. In this case, TBP has been widely recommended and recognized as an appropriate and successful method (Michaelsen et al., 2023). De Graaff & Kolmos (2003) suggest the existence of an amazing diversity of educational practices, this is in line with the implementation of the TBP method which views problems as the starting point of the learning process. The types of problems studied are usually based on real-life situations that have been selected and adapted to meet educational goals and criteria.

The series of TBP applications starts by posing an interdisciplinary problem that is open and student-centered (Brassler & Dettmers, 2017). Here, the lecturer acts as a facilitator of the learning process to ensure the learning process runs well. Thus, through TBP students can develop in-depth knowledge including the ability to think critically, collaborate, be creative, and communicate effectively. More than that, students as a team produce a meaningful product or work.

Table 1: Objectives, Principles, and Characteristics of the TBP Method (Hertel et al., 2004)

Purpose	Principles	Characteristics
✓ Train students' proactive attitude in solving a problem.	✓ Centralistic	✓ Critical thinking skills are emphasized.
✓ Sharpen students' ability to describe a problem in class.	✓ Guiding Questions	✓ Critical thinking skills are emphasized.
✓ Increasing class student activity in solving complex problems until real results are obtained.	✓ Constructive Investigation	✓ Critical thinking, analysis and evaluation are emphasized.
✓ Sharpen students' skills in using tools and materials in class to support their learning activities.	✓ Autonomy	✓ Feedback is provided quickly.
✓ Train students' collaborative nature.	✓ Realistic	

The learning steps in Project Based Learning as developed by The George Lucas Educational Foundation (Wiranegara, 2019) consist of:

- 1) Start With the Essential Question. Learning begins with essential questions, namely questions that can assign students to carry out an activity. Take topics that correspond to real-world realities and start with an in-depth investigation. Teachers try to make the topics raised relevant to students.
- 2) Design a Plan for the Project. Planning is carried out collaboratively between teachers and students. In this way, students are expected to feel "ownership" of the project. Planning contains the rules of the game, selecting activities that can

support answering essential questions, by integrating various possible subjects and knowing the tools and materials that can be accessed to help complete the project.

- 3) **Create a Schedule.** Teachers and students collaboratively prepare a schedule of activities to complete the project. Activities at this stage include: (1) creating a timeline for completing the project, (2) creating a deadline for completing the project, (3) bringing students to plan new ways, (4) guiding students when they make ways that are not related to the project, and (5) asking students to make an explanation (reason) about choosing a method.
- 4) **Monitor the Students and the Progress of the Project.** The teacher is responsible for monitoring student activities while completing the project. Monitoring is carried out by facilitating students in each process. In other words, the teacher plays the role of mentor for student activities. To simplify the monitoring process, a rubric was created that can record all important activities.
- 5) **Assess the Outcome.** Assessments are carried out to assist teachers in measuring achievement of standards, play a role in evaluating the progress of each student, provide feedback on the level of understanding that students have achieved, assist teachers in developing subsequent learning strategies.
- 6) **Evaluate the Experience.** At the end of the learning process, teachers and students reflect on the activities and results of projects that have been carried out. The reflection process is carried out both individually and in groups. At this stage, students are asked to express their feelings and experiences while completing the project. Teachers and students develop discussions to improve performance during the learning process so that in the end a new finding (new inquiry) is found to answer the problems raised in the first stage of learning.

In the team-based project method, teachers provide more opportunities for students to develop collaboration skills because they give greater weight to the discussion and individual learning process compared to the explanation process..

Learning uses the TBP method in Era 4.0

In the 4.0 era, the rapid development of information and communication technology has had a positive impact on improving performance in various fields, thereby also improving the quality of education. At the tertiary level, communication and information technology has many uses, including improving the quality of learning resource systems, including using the internet

Through an internet-based learning system, learning management consisting of scheduled lectures, as well as independent assignments and structured assignments that can be planned in control and monitoring, internet-based learning conditions are increasingly diverse and always updated (Jolliffe et al., 2012) found that among the many There are several characteristics of the methods and technology used in internet-based learning, namely: 1) educational material consists of text, graphic and multimedia elements such as video, audio, and animation; 2) the existence of synchronous and asynchronous communication applications, such as video conferencing, chat rooms or discussion forums; 3) using a web browser; 4) the material is stored, maintained and managed on a web server; and 5) use of TCP/IP and HTTP protocols to facilitate communication between students and course materials or learning resources.

Cook et al (2010) explain that internet-based learning must have several characteristics, namely: 1) the use of electronic technology services where teachers and students, students and fellow students, or instructors and fellow teachers can communicate relatively easily without anything limiting them. procedural issues; 2) use of computers (digital media and computer networks); 3) the use of independent learning materials stored on the computer so that teachers and students can access them anytime and anywhere; and 4) and utilize learning schedules, curricula, learning progress results and matters relating to educational administration which can be viewed on the computer at any time

The learning process must be supported by appropriate learning guides to increase the achievement of learning outcomes (Naidu, 2006). This is because the face-to-face time before class is very limited compared to the amount of material that must be presented. Therefore, a learning guide is needed that can activate students in learning. The learning guide includes web-based electronic modules that enable students to improve their learning outcomes by actively emphasizing student independence.

This TBP-based electronic module can be understood as a learning material module that is displayed via electronic means such as the web. Several electronic tools can be combined to build this type of electronic module: the WordPress Content Management System (CMS) as a place for presenting material, the YouTube video sharing site which allows information to be presented in video form, and the Classmarker Quiz Management System (QMS) which introduces an assessment system web-based automation (Liimatta, 2015).

There are three test instruments in the design stage of the TBP-based e-module testing instrument, namely a material feasibility test instrument for material expert presenters, a media feasibility test instrument for media expert presenters, and a product usability test instrument in design. stage. I'm listening. The TBP-based e-module development stage was realized by creating a mobile version of the initial TBP-based e-module product. The product was created using CMS WordPress, video sharing site YouTube, and QMS Classmarker.

This TBP-based e-module has the characteristics of a complete digital-based learning resource, where information sources can also be found in the form of text, images, assignments, and educational videos. In addition, the electronic module is equipped with interactive web discussion features, practice questions, and assessment questions to enable a self-assessment process.

Modules are effective teaching materials that are effective in achieving learning objectives. Modules are independent learning packages that are systematically designed to help students achieve learning goals (Nurhasnah et al., 2020). As technology advances, modules can be presented in digital format. An electronic module or e-module is a display of information in book format that is presented electronically using a hard disk, diskette, CD, or flash disk and can be read using a computer or electronic book reader.

Flip book maker is a piece of software that can be used to present electronic display modules. Flip book maker is software that has the function of opening each page like a book. Flip book maker software can create and change PDF files, images/photos into a physical book or album when we open each page. The final result can be saved in .swf, .exe, .html format (Wijayanti et al., 2016).

Apart from the TBP module, it is a learning method that provides lecturers with the opportunity to manage learning in class by involving project work. The goal is that in completing the tasks they face, students can be independent. The learning steps in a Team-Based Project (Nasir, 2022) are: Determining Fundamental Questions, Designing a Project Plan, Developing Schedules, Monitoring students and Project Progress, Testing Results, and Evaluating Experiences.

DISCUSSION

Project-based learning has become an increasingly popular approach in the world of education to prepare students to face the challenges of an increasingly complex and dynamic world of work. A literature review of the current concepts and practices of project-based learning presents an in-depth understanding of this approach and its impact on students' readiness to face a diverse world of work.

Research articles related to this topic provide valuable insights into the implementation of project-based learning in various contexts and disciplines. For example, research by Ginanjar et al., (2021) highlights the importance of promoting critical thinking skills through online project-based courses.

The results of this research show that this approach is effective in improving students' critical thinking skills. Likewise, a study conducted by Winatha (2018) evaluated the effectiveness of project-based learning methods in decision-making engineering courses using product-oriented modules. This research shows that this method is effective in improving students' decision-making skills.

Prawira et al (2022) reported the results of research on the implementation of case-based methods and team projects in designing packaging designs for Micro, Small, and Medium Enterprises (MSMEs) in Cimahi City. The results show that the combination of the two methods is effective in developing students' skills in designing product packaging.

Meanwhile, research by Nadhiroh & Trilisiana (2020) explored the use of team-based project methods and case methods as strategies for developing student skills. This study highlights the importance of developing creative, analytical, and collaborative skills through project-based learning. From these articles, it appears that project-based learning is an effective approach in preparing students to face the challenges of the world of work by providing learning experiences that are contextual, collaborative, and relevant to the needs of the current job market.

A literature review of current concepts and practices of project-based learning is important in enriching understanding of this approach and providing guidance for educational practitioners in designing relevant and effective learning programs.

CONCLUSION

The Team-Based Project Learning Method helps students learn by working on real projects, not just listening to the teacher. This improves their critical thinking and problem-solving skills. This method is suitable for preparing students for the modern world of work that demands collaboration and technical skills. Although effective, results may vary depending on the subject and how it is taught. So, educators need to understand and apply this method appropriately.

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