

## THE IMPACT OF PROJECT-BASED LEARNING ON STUDENT ACHIEVEMENT

*by:*

**Josafat L. Hernandez**

*Teacher I, Renato L. Cayetano Memorial School*

Project-based learning (PBL) is a novel approach to inquiry-based learning that is focused on a subject's concepts and principles. It uses a variety of resources and ongoing real-world inquiry-based learning activities to help students produce a finished project and find solutions to a number of related problems in a set amount of time. Project-based learning is a novel approach to student-centered learning that aims to develop 21st-century skills, particularly higher-order thinking skills. Higher-order thinking is based on problem-solving, which is a demanding task that highlights real-world scenarios and open environments. Project-based learning encourages students to keep exploring while they work through problems, which furthers the development of higher-order thinking.

One viewpoint holds that project-based learning may significantly improve student learning outcomes including motivation, academic performance, and higher-order thinking skills. Karpudewan et al. (2016) looked at the feasibility of using a project-based learning strategy to improve secondary school students' energy literacy. They discovered that pupils exposed to a PBL curriculum outperformed their peers on assessments of their knowledge, attitudes, actions, and beliefs about energy.

Hattie's (2009) meta-analysis compiled research results from several studies and validated that project-based learning (PBL) improves student performance. According to Hattie's study, PBL often produces better academic results than traditional teaching strategies. PBL's interactive and student-centered design empowers learners to take charge of their education, hone critical thinking abilities, and apply what they've learned to real-world situations – all of which boost academic achievement.

Additionally, research conducted by Bell et al. (2010) and Larmer et al. (2015) examined the effects of PBL on certain subject areas, such as science and mathematics. Bell et al. (2010) discovered that compared to pupils in regular classes, PBL participants in mathematics showed greater levels of mathematical reasoning and superior problem-solving competence. Similarly, students taking part in PBL demonstrated noteworthy increases in topic mastery and scientific inquiry abilities, as well as significant gains in science accomplishment, according to Larmer et al. (2015). As a result, project-based learning, or PBL, has been known as a revolutionary teaching strategy with profound effects on student performance. Studies repeatedly show that PBL enhances students' academic achievement by promoting a deeper comprehension and retention of material in a variety of subject areas.

Additionally, PBL fosters critical thinking abilities as students work on practical, inquiry-based projects and solve real-world issues. As students take charge of their education and establish a sense of purpose, this approach also increases motivation and engagement. Furthermore, PBL fosters the growth of critical 21st-century abilities that are necessary for success in the modern world, such as cooperation, communication, creativity, and problem-solving. It's noteworthy that PBL has successfully reduced performance disparities and equipped students for the difficulties they would face in both the workforce and postsecondary education. The effect of project-based learning on student accomplishment is still a fascinating field of research, with opportunities to improve educational outcomes and equip students for success in the future. This is especially true as educators continue to experiment with novel teaching strategies.

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