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Problem-Based Learning (PBL) in Primary Education: Enhancing Critical Thinking, Creativity, and Collaboration

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Abstract. This study explores the impact of Problem-Based Learning (PBL) on developing critical thinking, creativity, and collaboration in primary education. Conducted at Vosiq International School with 80 students from grades 2 and 3, it compared traditional instruction with PBL on topics like environmental protection and water scarcity. Findings revealed that PBL students showed higher motivation, creativity, and teamwork, while traditional groups focused mainly on factual recall. Despite requiring more time and teacher preparation, PBL effectively enhanced engagement and higher-order thinking, demonstrating its value for strengthening 21st-century skills in Uzbekistan's primary schools.

Keywords – Problem-Based Learning (PBL); primary education; creativity; critical thinking; student motivation; collaboration; teaching methodology; quasi-experimental study

Introduction. Globally, education systems are moving away from traditional teacher-centered instruction toward more active and student-centered approaches. This shift is motivated by the need to develop higher-order thinking skills, creativity, and collaborative abilities that prepare learners for the challenges of the modern world. Among these innovative strategies, **Problem-Based Learning (PBL)** stands out as an effective method of cultivating such skills. PBL positions learners as active participants who solve real-life problems, thereby fostering critical thinking, problem-solving, and teamworkⁱ. In traditional classrooms, knowledge is often delivered by the teacher in a ready-made form, and students' role is largely passive. By contrast, in PBL environments, learners engage in inquiry, questioning, and self-directed exploration, which strengthens their ability to apply knowledge meaningfullyⁱⁱ. Prior studies have emphasized that PBL not only improves subject mastery but also enhances motivation and creativity (Birgili, 2015; Dolmans et al., 2005). Primary education represents a foundational stage where habits of independent learning, observation, and creative thought can be instilled. Thus, introducing PBL in this stage has both scientific and practical significance.

Methodology





The study was carried out at Vosiq International School with 80 students from grades 2 and 3. Each grade consisted of two groups — one control group taught through traditional teacher-centered methods and one experimental group instructed using the Problem-Based Learning (PBL) approach. A quasi-experimental design was employed, and each instructional unit was delivered over three sessions. In the traditional method, lessons included teacher explanations, group or individual tasks, and oral recitation. In the PBL method, students were introduced to a real-world problem, engaged in group discussions and poster creation, and presented their findings through debates and group presentations. The instructional topics focused on “How can we protect the environment?” for grade 2 and “Water scarcity” for grade 3, both reframed as practical, problem-oriented questions to encourage critical thinking and creativity. Data were collected through pre- and post-tests to assess knowledge, motivation surveys to measure student engagement, observation checklists to track collaboration and problem-solving, and project evaluation rubrics to assess creativity and teamwork. Quantitative data were analyzed using descriptive statistics and t-tests, while qualitative data from student work and observations were thematically analyzed to identify patterns of engagement and collaboration. Ethical approval was obtained from the school administration, and informed consent was received from parents. All student data remained anonymous, and participation was entirely voluntary.

Discussion. The findings reveal that **PBL enhances creativity, motivation, and collaboration** more effectively than traditional methods. Learners not only retained knowledge but also contextualized it within real-life applications, echoing previous research that links PBL to 21st-century competencies ⁱⁱⁱ(Birgili, 2015; Armitage et al., 2015). Traditional instruction, while effective for factual recall and test preparation, lacked opportunities for developing higher-order thinking or fostering engagement ^{iv}(Erdogan & Senemoglu, 2014). These findings suggest that a blended approach may be optimal: combining traditional methods for knowledge delivery with PBL for skill development. Nevertheless, implementing PBL poses challenges: it is time-intensive, requires strong methodological preparedness from teachers, and assessing group work outcomes objectively can be difficult ^v(Dolmans et al., 2005).

Conclusion. This study confirms that **Problem-Based Learning is an effective pedagogical strategy for primary education**, especially in developing creativity, critical thinking, and collaboration. While traditional teaching secures structured knowledge transmission, PBL better prepares





students to tackle real-world challenges. Future research should extend this inquiry to larger samples, different subject areas, and digital or hybrid PBL models. Such efforts will further validate PBL's role in equipping learners with essential competencies for lifelong learning and global citizenship.

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