

## Active Methodologies and STEM Education: A Luso-Norwegian Study within the ERASMUS+ Project

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### Abstract

This paper presents a mixed-methods study exploring high school students' perceptions of science as a foundation for a pedagogical intervention using educational robotics (Ozobot). Baseline data from 40 Portuguese and Norwegian students reveal a significant "engagement gap": although 62.5% value science for understanding natural phenomena, only 20% express a strong interest in formal science education. Data indicate a preference for practical, gamified environments, with 72.5% identifying games as highly motivating despite their limited use in classrooms. In response, a transdisciplinary STEAM intervention grounded in Project-Based Learning (PBL) was implemented. Portuguese students from diverse fields—ranging from IT and Sciences to Humanities and Tourism—collaborated to develop an original educational game focused on marine sustainability. Guided by constructionist principles, students programmed Ozobots to navigate simulated ecological threats. As part of an ERASMUS+ initiative, these students will implement the game with their Norwegian peers, hoping to demonstrate that integrating robotics and cross-border collaboration promotes computational thinking and environmental citizenship, highlighting the necessity of transdisciplinary, international initiatives in modern STEM education.

### Keywords

Computational Thinking, Educational Robotics, Marine Sustainability, Ozobot.