Stem in Action: Exploring the Universe with Projectbased-Based Learning

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Abstract

As a Physics and Science teacher, PhD student passionate about STEM education, I design project-based learning units that connect scientific concepts with real-world exploration and interdisciplinary thinking. This workshop invites educators to experience how digital astronomy tools such as Stellarium can transform traditional lessons into engaging, inquiry-based projects. The session is intended for Physics/science teachers at all levels who wish to enrich their practice with interactive, student-centered approaches. Participants will model a project that blends observation, simulation, and creative extension. For example, they will explore how Stellarium can be used to identify constellations, track planetary motion, and compare simulated skies with real observations. Teachers will then discuss how to scaffold students' reasoning, prediction, and reflection while integrating digital tools into authentic scientific inquiry. Key takeaways include practical strategies for designing astronomy-themed STEM projects, methods to connect physics and mathematics with students' everyday experiences, and approaches to adapt resources for different age groups and classroom contexts. This workshop contributes to the broader goals of innovative education by promoting curiosity, creativity, and intellectual growth. Participants will leave with concrete ideas and resources to help students understand core scientific principles and develop the confidence to explore, question, and flourish as scientists and lifelong learners.

Keywords: Astronomy; Digital Tools; Inquirybased-Based Learning; Physics Education; Stellarium