



Idaho State University

# ***GREAT IDEAS IN TEACHING*** ***MINI CONFERENCE***

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ISU College of Education, ISU Center for Learning and Instructional Excellence,  
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### **Course Design Elements of a Vertically Integrated Project (VIP) Course that Fosters Students' Project Ownership**

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Opportunities to authentically engage in the disciplinary work of biologists is critical for biology learning. Undergraduate research experiences increase interest in STEM careers, promote diverse career pathways for marginalized students, and increase enrollment in graduate education among underrepresented groups (Walker et al. 2023). However, according to Handelsman et al. (2022) access to these experiences is currently limited, so in the last 12 years, science faculty have worked to address this problem by designing course-based research courses. Hanauer et al. (2012) developed course design recommendations based on a study focusing on three different URE structures, excluding VIP. This led us to ask, "What course design elements of a VIP course foster students' project ownership?"

This research question was addressed through a single naturalistic case study, allowing for triangulation of multiple data sources (Creswell and Poth 2018). Themes that emerged from coding the undergraduate student interviews were triangulated for validity with emerged themes from faculty interviews.

Three main themes emerged: vertical structure, presentation opportunities, and course flexibility. The vertical structure, which brings together faculty, graduate, and undergraduate students, creates unique opportunities for undergraduates at various points in their academic career to take up project ownership by collaborating on a multi-semester research project. Students and faculty also recognized how opportunities to present their research were significant for undergraduate students' project ownership. The students recognized how the course flexibility allowed them to shape the science and their roles in it while faculty instructors described how they embraced flexibility to foster student agency.

This study provides a significant contribution to the literature on designing VIP courses by describing course design elements that foster students' project ownership to shape the research project and their roles. Such research is important to build a collection of best practices for designing VIP courses shown to foster project ownership.