UNDERGRADUATE EXPERIENTIAL CODING COURSES: COILING A SOFTWARE CLIENT [ABSTRACT]

Christine Bakke	University of Minnesota Crookston, Crookston, MN, USA	cbakke@crk.umn.edu

ABSTRACT

Aim/Purpose	Courses that include development of complex software projects aim to provide career-like experiences prior to a software development-focused capstone. This research shares an international collaborative project (COIL) whereby a remote instructor and their students are the clients for an undergraduate project-focused coding course.
Background	This work builds on previous multi-year, Design-Based Research that combined educational best practices in software project development with agile. Prior research incorporated the instructor in the role of both client and Scrum-master and resulted in students experiencing multiple complex software projects prior to the capstone and was conducted in two course formats: synchronous online and in person.
	There remains the challenge of incorporating a real client. The complexities and challenges of providing real clients in educational settings are well documented; and previous attempts to include real clients in a class setting have been unsuccessful. Involvement in international educational collaborations known as COIL formed the foundation for this exploratory study, as the remote instructor and their students provided the client experience.
Methodology	This pilot study examines the experiences of a homogenous and quasi-experimental population consisting of technology students taking a required research course. Validation of the homogenous study is obtained through a small class size, resulting in close interactions between respondents and the instructor, interview-like settings, and immersive data capture. The course modality was Traditional Online, in that students were traditional on campus students with the option to be in the classroom; however, delivery was synchronous-remote.
	The research involved students enrolled in a technology course in the United States as software developers, working with an instructor and their students

who were enrolled in an English class at a German University. Before beginning the project, the instructors met monthly to plan, and to align the project with their individual course outcomes. Throughout the project, COIL communication between the universities was exclusively online.

This study builds on previous Design Based Research focused on development and validation of educational tools and techniques combining Scrum, Student Ownership of Learning, guided learning, and a flipped classroom approach.

Contribution   This study is among the first to explore COIL as a software client and includes previously modified Scrum practices and tools that can be used to guide complex software projects. This study examines pilot data from an international collaboration where researchers and students have never met in person. It may be useful for institutions that are interested in providing technology students with additional complex software experiences.

Findings   {in progress, will be completed spring 2023}

Keywords   experiential learning, COIL, Agile, Scrum, software development, programming, student ownership of learning, active learning, iterative development, design-based research, computer science, information technology, software engineering, software development

AUTHOR

Dr. Christine Bakke is an associate professor of cybersecurity at Grand Canyon University, Phoenix, Arizona and a Software Engineering and IT lecturer for the University of Minnesota, Crookston. She earned her IT PhD from Capella, where she focused on robotics and programming instruction. She has higher education experience in IT, Computer Science, Software Engineering, and Cybersecurity; and 18 years of IT career experience primarily focused on networks, cybersecurity, database, and programming. She has a passion for active research that combines academic and professional best practices into meaningful real-world experiences in educational settings; of particular interest is the development of capstone-like experiences in sophomore, junior, and senior level courses. She currently advises student software and IoT projects including speech-assisting software for mute adults, a dementia-assistive game, technology-related ergonomics, and development of sport-IoT + software.