

Thesis Project Portfolio

SyncLink - Building An Expanded Cloud IDE Platform

(Technical Report)

Acceptance of Technology in STEM Secondary Education

(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Education is a crucial component of society. It provides us with new perspectives and experiences to evaluate the world around us. Through practice, problem-solving skills are developed and refined for daily use. Education allows people to draw on the experiences of those who came before them. With the explosive growth of technology and its incorporation into almost every aspect of our lives, it is imperative to discuss the shifting role of technology in education.

Both the research paper and technical paper were inspired by my personal experiences as a student within the Computer Science (CS) department and as a teaching assistant within the Applied Mathematics department. The ideas embedded within these papers took into consideration the sudden shift to online learning as the COVID-19 pandemic devastated the traditional methods of in-person instruction. I witnessed first-hand the difficulties of seeking help from instructors and providing assistance to students with the loss of the ability to directly interact with each other.

These difficulties led to the development of my technical capstone project. This project was a new tool proposal called SyncLink that was designed to help support remote collaboration among CS students and supplement remote assistance from teaching staff during office hours. At its core, SyncLink is an expanded Cloud IDE platform consisting of a web-browser application and mobile app. As part of the design phase, I consulted with CS teaching assistants and current students to determine what features would be beneficial to them as they adjusted to the loss of in-person amenities. After seeing wireframe demonstrations and hearing about its uses, the interviewed teaching assistants concluded that this platform would have been helpful to have during the remote learning period and saw the potential for future applications in other areas.

For the research paper, I decided to limit my discussion to the acceptance of technology in STEM education. Using the Social Construction of Technology (SCOT) STS framework, this paper will explore the intricacies and challenges of integrating technology into STEM coursework. Although the introduction of technology has great potential for improving various teaching methods and creating otherwise impossible experiences for students, issues such as the Digital Divide and other logistical concerns must be addressed first.

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