

Sociotechnical Synthesis

STS 4600

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As technology continues to evolve, so too should educational practices. An effective teacher is a teacher who learns with their students, adapting their own understanding of a topic and the delivery to their students with the changing times. Some of these changes happen rapidly, while others can take decades to become noticeable. Two examples of events that have necessitated change in teaching practices are the COVID-19 pandemic and the disabilities rights movement. COVID-19 required novel programs to teach students research methods and practices, while the increasing protection of the disability community prompted dialogue into the allowances that should be required of school districts to facilitate an equitable learning environment for those with both physical and cognitive disabilities.

The technical portion of the project produced the framework for Starting an Undergraduate Research Experience, or SURE. Previously, the University of Virginia lacked a research education program for engineers to learn the basics of a research lab, methodology and research method fundamentals, and how to become involved in local research opportunities. The SURE workshops provided these lessons, in addition to providing students with a peer mentor and a small group environment. Key to the program was providing equal access for students and increasing feelings of belongingness, critical components in SURE's aim of lowering the barrier to entry for aspiring undergraduate researchers. Results indicated that the program assisted with increasing research involvement, feelings of belongingness among potential researchers, and increased competency in skills taught during the workshops. The STS research was equally revealing, indicating that there exist many technologies capable of increasing the quality of life for students with disabilities. While some of these technologies are still in development, others are readily accessible for students and only require administrative support from school districts to begin being implemented.

Completion of both the technical and STS portion of this thesis revealed an increase in student emotional support in the previous decade. While delivering content will always be paramount to educational institutions, an emphasis on feelings of belongingness and lowering

barriers to entry are crucial in creating positive long term cognitive and educational outcomes for students. Ensuring the success, altruistic in intention, can be sabotaged by failing to provide proper ethical considerations for issues such as student-teacher power dynamics, accidental exclusion, and creating needlessly large barriers to entry. Future work will continue to explore how to facilitate opportunities in research and education for students at UVA and beyond.

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