

University pathway for commercializing undergraduate bioengineering student inventions

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Bioengineering and biomedical engineering inventions at universities are typically commercialized by faculty and graduate student led teams, with inventions arising from university research laboratories. This paradigm overlooks the large and creative undergraduate student body. Georgia Tech has created a program, CREATE-X, to pursue this opportunity. Its success is staggering: over the past seven years CREATE-X has directly impacted 6000 students and fostered the founding of 230 student-led companies valued at over \$1.3B. Bioengineering and biomedical engineering students participate in proportion to their representation on campus (~10%). We will report progress on the development and impact of four curricular CREATE-X programs that form this pathway. A “Startup Lab” course enables students to learn about evidence-based entrepreneurship and critically, customer discovery. If the students have an invention idea, they can enroll in “Idea-to-Prototype”, an undergraduate research course that provides faculty mentors, guidance, seed funding, and additional university resources to build functional prototypes of their ideas. Biomedical engineering students can then enroll in the “CREATE-X Capstone Design” course, in which teams of seniors design and build prototypes of their invention ideas and explore whether there is a market demand and value proposition for them. This is done in a nurturing environment, with mentorship and financial support for these entrepreneurial teams, including relevant lectures catering to the needs of a startup. Lastly, A 12-week summer, intensive “Startup Launch” internship program offers mentorship, space, facilities, and significant seed and angel funding opportunities (e.g., \$10k+). These courses earn credit towards the Bachelor of Science in Biomedical Engineering degree, either as free electives, technical electives, or substitutes (e.g., Capstone) for the traditional equivalent.

Examples of successful bioengineering student teams will be presented, such as Ethos Medical, Stridelink, Augment Health, and Medsur, which have collectively raised millions of dollars and have full-time employees. These teams have used these programs to non-linearly, and iteratively to meet their needs to move their invention and startup forward. In turn the culture of bioengineering and biomedical engineering at Georgia Tech has been transformed because of this student energy and success, leading to more faculty participation, more financial support, and recruiting successes. We believe and will present on how this culture of “entrepreneurial confidence” being fostered by CREATE-X is transformational and represents, in no small part, the future of engineering education.