

## **Undergraduate Engineering Entrepreneurship Education @ University of Michigan**

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The literature commonly credits the Harvard Business School for developing the first entrepreneurship course over 50 years ago. Historically, entrepreneurship centers grew out of business schools around the country, often focusing on teaching students how to create detailed business plans. In the past 10-15 years, more and more entrepreneurship centers are being launched outside of business schools, from engineering schools to liberal arts colleges. This growth in entrepreneurship education has stimulated the creation of new perspectives and approaches to entrepreneurship education, broadening things well beyond business plans.

Over the past 5 years, the University of Michigan College of Engineering has been exploring different curricula to effectively teach the engineering students about entrepreneurship. Through this effort, we have broadened our vision of entrepreneurship education to include five critical learning objectives:

1. Entrepreneurial mindset
2. Creativity and Innovation
3. Opportunity Identification: Is there an opportunity to pursue this idea?
4. System Integration: How do you put the pieces together to execute? How do you connect with the appropriate resources, channels, partners?
5. Execution: How do you make it happen?

The last objective, Execution, is most similar to the core content that is often offered in business school entrepreneurship education (i.e. financials, venture finances, leading organizations etc).

The UM COE educational program addresses these objectives through a number of mechanisms:

1. Establishing a common vocabulary
2. Experiential courses
3. Active co-curricular programming for real world feedback
4. Catalyzed networks

### *Establishing a Common Vocabulary: Customer discovery and the business model canvas*

Over three years ago, the U-M CFE has been incorporating Steve Blank's customer discovery approach into its curriculum. The customer discovery approach, in conjunction with the business model canvas, resonates with students because it offers an easy to understand executable framework. At the same time, it offers a common vocabulary that can be shared between classes. All of the Center for Entrepreneurship faculty, program directors and mentors are familiar with the customer discovery process and is used in our courses and co-curricular activities to

establish a consistent framework. The consistent use of the terminology within the community has decreased commonly observed misunderstandings between disciplines.

*Experiential Courses: action based learning, real world problems, collaboration, peer to peer feedback*

All Center for Entrepreneurship courses must be experiential – students must be actively putting their skills into action. Classroom instruction in solitude is merely an academic exercise. Students work in teams and are encouraged to work on real world problems as you would in the real world. Student teams are also instructed on how to give critical feedback to other teams – either oral or written. When students are pushed to engage the real world with real world problems in this context, they are more likely to take ownership of their experience and learning accelerates. Students become more likely to teach themselves, advance their own thinking, and develop an entrepreneurial mindset.

CFE classes also integrate entrepreneurs and investors throughout their curriculum – typically teaming academics with these practitioners. This is a critical feature that cannot be overlooked. The partnership of an academic and entrepreneur in the classroom is vital. Many academics are not entrepreneurs, yet they are well versed at instruction and guiding students through the learning process. At the same time, not all entrepreneurs can teach. It is important to avoid a semester of anecdotes.

*Active Co-curricular Programming for Real World Feedback*

Simply taking entrepreneurship courses is not sufficient for a well rounded entrepreneurship education for several reasons: a course is a course, the life cycle of true entrepreneurship experiences lasts longer than 7-14 weeks, and students need to learn that an “A” does not guarantee success. At the same time, students that are not quite ready to commit their time to an entire course, can become engaged in entrepreneurship by other means. Thus, strong entrepreneurship programs should have a robust co-curricular program that allows students to put their learnings into action. The Center for Entrepreneurship has established a number of programs that engage entrepreneurship students throughout the year:

1. 1000 Pitches: students from across campus compete for financial awards, encouraging them to share their entrepreneurial ideas
2. Clean Energy Venture Challenge: Students from across Michigan participate in training and propose business models that address the challenge of clean energy
3. Startup Treks: the CFE takes students to entrepreneurial hubs across the country (Silicon Valley, Chicago, New York and Boston) to pitch their ideas to university alumni, venture capitalists and entrepreneurs
4. TechArb: Student incubator
5. Provost Funded Jump Start Grants: The Provost provides \$50,000/year to support student entrepreneurial initiatives- prototype development, travel for customer discovery and presentations, and legal services.

6. Start-up Career Fair: Each year, over 100 start-up companies come to University of Michigan to recruit U-M students.

*Catalyzed, Integrated Networks and Mentorships*

One of the most critical lessons learned in developing an entrepreneurship education program, and often overlooked, is the fundamental need to develop an integrated network between university partners, the local entrepreneurial community and entrepreneurial alumni. Successful entrepreneurs must rely on this network and entrepreneurship in isolation is guaranteed failure. The CFE actively cultivates this network through its human routers to ensure that students are connected with the correct resources. All CFE teams are assigned entrepreneurship mentor for guidance and feedback. Partner organizations are involved in all aspects of CFE activities as faculty affiliates, co-instructors, mentors, and judges. Many of our partner organizations also offer outreach office hours and seminars to our students (i.e. Office of Technology Transfer and the Zell Entrepreneurial Law Clinic). It is important to recognize that there must be a clear respect for practitioners - those entrepreneurs that execute on a daily basis – something that can often be forgotten by academics.