

## From the Classroom

# Bioentrepreneurship education and training (BEET) trends

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## ABSTRACT

Biomedical and health entrepreneurship continues to expand around the world. Driven by global pressures to optimize the allocation of scarce resources, life science bioentrepreneurs are creating innovative products, platforms, service and systems that deliver more value. As a result, the demand for biomedical and health professional entrepreneurial talent has increased and biomedical and health innovation and entrepreneurship education and training (BEET) programs are growing to fill the gap.

This paper highlights 10 trends in bioentrepreneurship education and training.

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**B**IOMEDICAL AND HEALTH entrepreneurship continues to expand around the world. Driven by global pressures to optimize the allocation of scarce resources, life science bioentrepreneurs are creating innovative products, platforms, service and systems that deliver more value. As a result, the demand for biomedical and health professional entrepreneurial talent has increased and biomedical and health innovation and entrepreneurship education and training (BEET) programs are growing to fill the gap.

However, there are still significant barriers to the growth and development of sustainable BEETs.<sup>1</sup>

1. They engage participants in endeavors that get short shrift on campuses: teaching and innovation. Generating clinical and grant revenue takes priority. Few campuses reward faculty or students for developing or commercializing an idea or paying them extra to teach the courses.
2. Money is tight and little is available to support these programs. They run on a shoestring and are expected to be self funded, and require uncompensated time from faculty being paid by other disciplines.

3. Biomedical entrepreneurship rests on a four legged stool that includes education, networks, experience and money. The last are difficult to create, scale and sustain.
4. Bioentrepreneurship educators have no home. It is not yet a recognized academic domain, there are limited places to publish peer reviewed research and manuscripts (the *Journal of Commercial Biotechnology* is an exception), and promotion and tenure committees attribute little or no value to the enterprise.
5. By its very nature, bioentrepreneurship education is an interdisciplinary, multicampus effort with all of the bureaucratic and systems issues that engenders. There is frequently a lack of alignment of academic entities driving growth and short term money issues trump long term investments in entrepreneurship education innovation.

Despite these obstacles, enterprising educational entrepreneurs are devising ways to overcome them. Here are 10 trends that exemplify that theme:

1. Bottom up initiatives are displacing top down initiatives. Community based programs and educational offerings are displacing the requirement for university centricity. Free massive online open courses (moocs), the flipped classroom and the lean startup movement have commoditized and

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democratized entrepreneurship education. Recent examples include a free online courses on Coursera ([www.coursera.com](http://www.coursera.com)), The Harvard Business School and Udacity ([www.udacity.com](http://www.udacity.com))

2. Community based accelerators, generators, co-working spaces and incubators are exploding, particularly in the area of digital health. While their business models are different, there are still lingering questions about their value propositions, their success rates and metrics and whether they produce products and services that are clinically validated.<sup>2</sup>
3. Faculty and administrators are experimenting with different structures, processes and pedagogical techniques to deliver the most value for their students. They are experimenting with flipped classroom techniques, MOOCs and much more. Some are designed for undergraduates and some for graduate students. Others offer certificates or formal degrees. Courses are either face to face, hybrid or entirely online.<sup>3</sup>
4. All BEET is local, depending on the culture, leadership, vision, strategy, resources and student demand. Programs reflect assets on the ground the ability of program directors, faculty and administrators to overcome local hurdles.
5. No two programs are exactly alike. When you've seen one program, you've basically seen one program.
6. The value of these programs are still questionable. We need long term, valid ways to measure the appropriate outcomes. Those outcomes go beyond short term economic development and technology transfer metrics. Since value creation and the life science innovation roadmap is a long and tortuous one, patents, licensing revenues and job creation don't always capture the long term value proposition.
7. Educators and administrators are trying to establish BEET as a legitimate international

academic domain. Like international entrepreneurship, peer recognition will require peer reviewed research, publications, grants and other criteria imposed by the academy.

8. Most universities don't have the structure, policies or culture to launch and sustain BEET programs. They are being developed by entrepreneurial educators who believe in the mission and are getting it done despite their universities.
9. BEET educators are educational social entrepreneurs themselves who need support and recognition if they are to be successful.
10. The demand for BEET will increase, particularly as pressure to get "impact" out of research increases.

We have witnessed the birth of a new discipline, International Bioentrepreneurship, in the last 5 years. In the future, we will see the continued growth and development and, hopefully, the validation of the value proposition: creating graduates with a global biomedical and health entrepreneurial mindset.<sup>4</sup>

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