CHAPTER 21

Injecting Relevance to make Innovation more Impactful at Universities

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After a short tenure in teaching at universities, I have pursued an entrepreneurial career since 1980. Nine years ago, when I joined the MIT Corporation in Cambridge, Massachusetts, I got reconnected back to the academic world. Together with other like-minded individuals at MIT, I have been experimenting with ways in which to make the innovation at MIT have a bigger economic and societal impact. After the initial success of the approach at MIT, my wife and I started a similar effort in India targeted at fostering innovation in Indian universities to make a difference in social entrepreneurship. The effort in India is now five years old. This paper summarizes the results of these two efforts to encourage discussion on how such approaches can be used to further the innovation in the 21st century.

THE EFFORT AT MIT

MIT with its culture of "*Mens et Manus*" (mind and hand) already excels in making the technological innovation useful to the world. However, there is an opportunity to make it better. The "Deshpande Center for Technological Innovation" was set up at MIT in 2002 with funding of $20 million. The Kauffman Foundation did an extensive study of this center and the von Liebig Center at the University of California San Diego. They found the models to be successful in promoting academic innovation to directly address real world problems. Lesa Mitchell, Vice President of Advancing Innovation at Kauffman Foundation, is facilitating similar centers at other universities. The following are some of the lessons I have learned from this effort.

Insight

Researchers who work on applied research always think about how their ideas can impact the world, both economically and socially. There is no lack of desire on the part of the researcher to see the impact. The idea has to be directed towards solving a burning problem in the world to have an impact. You cannot mandate innovation. However, bringing the knowledge of what the world needs to the innovator will help the innovator make choices that increase the probability of impact.

Research at universities now is where the engineering practice was in industry a few decades ago; an engineer designed the product and the salesman then went looking to sell the product. Today in industry, an engineer only starts designing the product after fully understanding what the customer needs. However, in the current practice of research, the researcher innovates, patents the idea and then the technology licensing offices try to find applications for the patents. The Center at MIT has found that bringing the practitioners and the researchers together early on changes the culture of innovation. There is a lot of give and take between what is possible and what is worth solving to come up with an innovation that can have impact. Injecting relevance early in the process of innovation increases the probability of that innovation having a bigger impact on the world. The faculty members fully embrace this idea. In fact, MIT has created a new course called I-TEAM which brings engineering and MBA students together to explore how to target ideas at appropriate markets. This has been a very popular course.

Researchers, in the campus environment, are idea generators. When a new idea comes along, the researcher is not only excited by the elegance and novelty of the idea, but is also excited about where it can be useful. A few months down the road, the researcher will have ten more ideas that have sprung up from the original idea. Left to himself or herself, a researcher will choose to pursue one of those ideas that makes sense to his or her own environment. However, if the researcher is connected with practitioners, he would have the benefit of relevance to pick an idea that has a better chance of creating a bigger impact.

Process

The Center achieves its mission through several approaches: Grant Program, Catalyst Program, Innovation Teams (I-Teams) and Events.

Faculty members apply for grants to the Center twice a year. The funding from the Center enables the faculty and their students to pursue exciting new avenues of research on novel technologies that could have a significant impact. These grants are selected by a panel of faculty and business leaders, and are selected based on potential for impact, technical merit, team consid-

erations and timeframe. Ignition Grants of $50,000 are awarded to fund proof of concept explorations, and Innovation Program Grants are awarded in the range of $50,000-250,000 to build on existing innovations at MIT and bring them closer to commercial viability. The objective of the funding is to nurture ideas with market potential and reduce the uncertainty around them so that an external party would invest in the technology. This could occur through various means, such as a VC-funded start-up or licensing by a company. In addition to the funding, the grants bring with them publicity, mentoring and connections with the business community.

Volunteers from the business community are central to achieving the Center's mission of helping MIT innovators achieve market impact. Catalysts are a highly vetted group of individuals with experience relevant to innovation, technology commercialization and entrepreneurship. Catalysts provide individual contribution to the Center and do not represent any company interests in their role as Catalysts. Catalysts are chosen based on the following qualifications:

- Experience in commercializing early stage technologies and/or mentoring researchers and entrepreneurs, and industry expertise.
- Willingness to proactively provide assistance to MIT research teams.
- Willingness to abide by the time commitment, confidentiality and conflict of interest guidelines.
- Commitment to the interests of MIT researchers and the Center.

The I-Teams (Innovation Teams) program provides an action-based learning experience for graduate students where students evaluate the market potential for research projects being conducted at MIT and develop "go-to-market" strategies.

The Center hosts a variety of events to bring together minds from the MIT and business communities.

The IdeaStream Symposium, held each spring, is our largest event. The Symposium is intended to showcase new MIT technology, educate the business community about leading-edge new technologies and facilitate connections between VCs, entrepreneurs, industry and MIT innovators. These symposia are by invitation only. The Center also collaborates with other programs on and off campus to promote a variety of events to enhance innovation within the community.

Results

So far the Center has reviewed 450 proposals submitted by the faculty. The Center has supported over 70 projects with about $10 million in grants. The grants have resulted in 18 startups that have raised over $140 million in capital. Over 60 faculty and 500 students have participated in the program and a new course has been designed to capture the process of taking the innovation

to the market. The process can be summarized by three actions: Select, Connect and Direct. Active participation of the business community in all three activities is essential for success: Selecting appropriate research to fund, Connecting the innovator to the marketplace and Directing them when they need help.

To further stimulate the economy and take advantage of the innovation across all the universities in Massachusetts, two other initiatives have been launched recently: MassChallenge and Venture Café. MassChallenge is a business plan competition supported by the Massachusetts government and local entrepreneurs to pick the top 25 plans and provide the seed capital. The goal of this program is to kick start 25 companies a year for the next three years to stimulate the Massachusetts economy. Venture Café is a coffeehouse, about 12,000 square feet, with WiFi connections and hookups for projectors and other devices to hone projects and ideas. The expectation is that such a place will energize the entrepreneurs and accelerate the ideas to the marketplace.

THE EFFORT IN INDIA

India is a vast country and several educational institutions have come up over the last 60 years. There are institutions like the Indian Institutes of Technology, All India Medical School, National Law schools, Indian Institutes of Management and Indian Institutes of Public Health which have international recognition. They get their strength from being able to select a few thousand from millions and holding smart students together in a campus environment. The faculty members at these institutions are dedicated, but lack the research infrastructure. This is improving, but has a long way to go.

India has to deal with two issues; millions of people and low affordability. If innovation is to have an impact, Indian universities have to bring new solutions at very affordable prices to millions. Indian scientists have shown promise; the Indian space program has shown results with modest investments. Indian industry understands the opportunity; for example, Telecom companies add 10 million cell phones a month that can be recharged incrementally 2 cents at a time and Tata Motors recently started selling a $2,000 Nano car.

India graduates approximately 400,000 engineering undergraduates from approximately 3,000 colleges. We picked BVB Engineering College, a college in a small town called Hubli, to see how we can bring innovation to this institution. The college has 4,000 engineering students and runs on a budget of $4 million a year. The students are bright and the teachers are dedicated. However, the students are taught to study and do well in exams. Students spend their time preparing themselves to provide canned answers to questions posed at the exams at the end of the academic year. There is a total lack of innovation in that education system. Students walk around with hundreds of

problems all around them, but they do not know that they have the ability to solve them.

In order to connect the students and the faculty to the problems in the surrounding area, we built a center for social entrepreneurship in the campus. For the last five years we have been funding approximately 70 programs by NGOs (non-governmental Organizations) in the areas of Education, Agriculture, Livelihood and Health. The enthusiastic participation by the students to get involved in these programs has been overwhelming. The participation started from the engineering campus and now has spread to all the surrounding colleges. Last year 1,000 students conducted 250 projects. This year we have 10,000 students involved with 2,000 projects. The enthusiasm of the students has now spread to the young faculty. They are bringing technological as well as other innovations to projects.

Problems exist in this world because people do not see a solution. Therefore, you need innovation to solve even the simple problems. The innovation always comes from a fresh perspective. The Social Entrepreneurship Center provides that fresh perspective to the students and young faculty by bringing their bright minds and the problems together. We also have 10 young men and women from the United States who spend a year on fellowship. There are approximately 30 students who spend the summer at this center from University of Southern California, Berkeley and North Carolina University. These visitors are the change agents in the social ecosystem.

The results of this effort have been excellent. For example, a kitchen was built in the city that serves midday meals to 185,000 school children every day. The kitchen uses good management tools and technology to maintain very high quality standards and has managed to serve nutritious meals that the kids love for 12 cents a meal. After the program was optimized in this city, it is now duplicated in other parts of India. This program currently serves 1 million meals to school children every day. By using a similar model as the Center at MIT, difficult social problems are being solved in India by connecting the academic innovation of universities to the needs of the real world.

CONCLUSIONS

The 21st century poses several grand challenges; clean water, clean air, climate change, energy, biodiversity and sustainability. The Universities can play a central role in coming up with solutions to these problems. The solutions will need "Eminent Technological Innovations" and thousands of innovative ways to localize the Eminent Innovations. The universities of the 21st century have to create educational programs and an echo system that injects a lot more innovation and entrepreneurship into their institutions to remain relevant to the world.

Institutions like MIT, with their depth in technology can come up with "Eminent Innovations". This paper shows that the probability of Eminent Innovation having a big impact on the world goes up substantially by connecting the innovator to the relevance.

An eminent Innovation will not impact all the six billion people in the world unless innovation is spread out to everyone in the world. The second example of the program being experimented in India shows that students can be energized to participate in solving local problems during their University education. In the process, students learn how to adapt big ideas to local problems to come up with affordable solutions.

In both cases, if the universities want to remain relevant, they need to reach beyond their campuses to connect young innovative minds to the world's problems.