

Report of the Stevens Institute of Technology

External Review Committee on

Academic Entrepreneurship and Technology Commercialization

March 12, 2012

Background

The External Review Committee (ERC) was established by Stevens Institute of Technology President Nariman Farvardin with a mandate to review Stevens' organization and programs for entrepreneurship and technology commercialization and to make recommendations pertaining thereto. President Farvardin set in motion this external review by:

- Appointing the members of the ERC (whose names and affiliations are cited at the conclusion of this report);
- Establishing an Internal Review Committee (IRC) to prepare a self-study on the background and current status of entrepreneurship and technology commercialization at Stevens;
- Conveying to the ERC an extensive list of suggested questions that the ERC might appropriately consider; and
- Charging the ERC on the evening of February 27th in anticipation of its full-day deliberations on February 28th at Stevens in which the ERC held in- depth discussions with members of the IRC, and thereafter meeting with representative groups of deans, faculty and students.

ERC perspectives relative to Stevens were formulated from discussions with President Farvardin, review of the IRC self-study, and meetings with the above mentioned representative groups. ERC recommendations are structured to be commensurate with and reinforcing to Stevens stated vision, goals, and differentiating factors as follows:

- Stevens' vision focuses on inspiring, nurturing and educating technology leaders of tomorrow while addressing the most challenging problems of our time;
- Stevens' goal is to provide (and be known for) well-rounded, technology-centered educational experience to all students, regardless of their majors, and to create a sustainable eco-system-based culture of innovation and entrepreneurship.
- Stevens' differentiating factors, include:
 - A technology-centric focus, with a very strong design component;
 - Solid and well known research;
 - Inter-disciplinary approach (including arts and letters);
 - Innovation and Entrepreneurship (I&E) as a university wide enterprise;
 - Location adjacent to NYC, one of the wealthiest and economically vibrant metropolitan areas in the world;
 - Small size that allows for agility and easy collaboration;
 - Solid record of successful alumni.

Recommendations

- A single office should be established for all entrepreneurship and technology commercialization programs and activities, reporting directly to the Provost. The ERC believes an appropriate name for this office could be the Office of Innovation and Entrepreneurship or OIE for short. (The ERC in particular recommends that the prior organizational terminology "academic entrepreneurship" should be discontinued.). The OIE should be viewed by faculty, students and other university stakeholders as the "one-stop shop" for innovation, entrepreneurship and the "first place to go if you want to start a company or get help or information regarding innovation and entrepreneurship."
- Within the OIE and reporting to the director of OIE, the ERC recommends the establishment of three operating components for each of the following functions; Education, Entrepreneurship Support, and Technology Licensing.

Associated with each of these functions is an aspect of providing outstanding public relations, promotion and marketing. Such outreach should include not only all students and faculty, but also the local community, the local geography and also national and international academic forums. The following paragraphs further elucidate topics relative to these functions, and the Appendix to this report provides the organization chart for OIE with summary mission statements for its functional components.

Education

- The ERC was impressed by the objectives of the I&EP program which imbeds entrepreneurship elements within all four years of the undergraduate learning experience through a well thought out strategy for all undergraduate students at Stevens. President Farvardin challenged the ERC to identify a single aspect of all the activities within the OIE enterprise which was impressive in its impact, noteworthy in its uniqueness, and which Stevens could exercise a leadership role. The ERC believes a prime candidate for this distinction could be a program of the type built on the principles described under the I&EP.
- The ERC recommends that there should be increased emphasis on the multidisciplinary aspects of senior design instruction, particularly drawing on students from different academic units.
- The ERC recommends an Entrepreneurship Minor be made available to all students at Stevens much like the current minor within the Schaefer School. The program is currently mostly business-focused; however it should also have entrepreneurial-related elements/courses. Combining or eliminating some of the existing courses may be accordingly necessary.
- The Stevens Scholars Program, a worthy program but not having a primary entrepreneurship focus, should not reside in the new OIE. Likewise the Research Grant Opportunities function within OIE should be responsible for entrepreneurship opportunities but not the totality of sponsored research opportunities.

- It is recommended that the term “technogenesis” be discontinued as it has not achieved over a number of years the identification and standing that was intended.

Entrepreneurship Support

- The ERC recommends a capability be established to provide assistance for the creation of start-up companies. The form this assistance would take is left to be determined at Stevens by means deemed most suitable. The senior design project can be viewed as the genesis point for start-ups for those students so inclined. Graduate student research likewise serves as the potential genesis for start-ups. Stevens needs to define what is meant by a “Stevens start-up company;” perhaps it would require active involvement of at least one student, one faculty member, or one alumnus. In the latter case involving an alumnus, Stevens could limit start-up assistance for a specified period of time following graduation, e.g. one or two years.
- Engaging mentors from outside of Stevens in support of various Stevens’ entrepreneurial programs can be of considerable merit. Hence the ERC recommends that outside mentors with suitable credentials be engaged in support of OIE programs. For example, industrial experts could be extremely valuable in participation in a senior design projects, not only in identifying real world projects that their company may have interest in implementing, but in also providing periodic guidance of ongoing projects. Another example could be the engagement of outside entrepreneurs with established track records to provide guidance to Stevens’ faculty and students relative to providing assistance for the creation of start-up companies. The essential point is that where entrepreneurship is involved, actual entrepreneurs are preferred.
- Networking activities are extremely beneficial in promoting a conducive entrepreneurship environment. The ERC strongly endorses networking events, such as the ongoing NJTech Meetup functions held monthly on the Stevens campus. These meetings should be broadly advertised and scheduled at times

suitable for faculty and student attendance. Means that Stevens could employ to enrich these programs, e.g. in attracting motivating speakers, should be encouraged.

- Another topic for which the ERC lends its endorsement is those activities at Stevens which showcase entrepreneurship activity and successes. The Stevens Elevator Pitch Competition is a good example of this as well as various recognition and award events which Stevens has already established and could build upon. Such activities naturally enhance networking opportunities.
- Entrepreneurship support also includes proactively creating an entrepreneurial “eco system” available to all faculty and students. Such an eco-system not only includes the mentorship and networking activities described above, but also should include interactions with other universities (especially those close to Stevens,) outreach to law and accounting firms which have demonstrated interest in sponsoring and supporting entrepreneurial activities and private equity and venture capital firms interested in funding Stevens start-up companies in the future.
- Stevens needs to improve its public relations functions with respect to acknowledging and publicly recognizing its “success stories,” which include celebrating its own successful alumni entrepreneurs. The ERC found that there was very little awareness by faculty and students with regard to highly successful entrepreneurs who are connected to Stevens in some way.

Technology Licensing

- There are several functional activities within the Technology Licensing office which need to be executed effectively: Licensing and managing Stevens IP portfolio, obtaining new IP (primarily patents), and negotiations for industrial contracts. The latter function would need to be conducted in coordination with the Stevens office of sponsored programs.

- The ERC believes the emphasis of Technology Licensing should be on overall “impact” to the university, rather than attempting to establish an all-encompassing metric of monetization as the sole metric of success.
- Protection of Intellectual Property through patenting is important but not equally important in all entrepreneurship activities. Furthermore, patent protection is costly and time consuming. A new drug discovery may absolutely require patent protection to be able to ultimately bring it to the consumer marketplace. On the other hand in other instances an invention may best be served by speed to market and early branding. Hence patenting in the university setting needs to have a suitable budget to motivate faculty, students and staff to be innovative and entrepreneurial but at the same time it needs to be selective and highly objective in seeking patent protection where there is a substantial rationale. This rationale is the need for downstream protection in a competitive commercial marketplace. The patent itself is not to be thought of as the end goal in itself, but as an important step along the way to commercialization. Hence the ERC believes there is undue focus on the patent itself by allocating cash awards for patent disclosures and patents issued, and recommends these cash awards be discontinued. At the same time the ERC favors all means of recognition (other than financial) in celebrating patents granted to faculty, students and staff – such as providing a patent plaque for the inventor(s), as well as a separate plaque held by the university and permanently mounted and exhibited in the appropriate university building.

Additional Commentary

In the course of the work of the ERC, especially from discussions with President Farvardin, the IRC, deans, faculty, students and staff, a number of insights were obtained that are sufficiently relevant to be included in this report. In some cases they may contribute as addenda or clarifications to the above ERC recommendations and in other cases they may be helpful in identifying other follow-up actions which Stevens elects to implement for an improved entrepreneurship program. These include:

- **“Hoboken Hub.”** President Farvardin suggested the idea of a “Hoboken Hub,” which would be a Hoboken community endeavor involving internal and external constituencies to Stevens working for a collective promotion of entrepreneurship. This exciting vision was reinforced by a student interviewed by the ERC who expressed the hope for Hoboken evolving into “a hotbed for entrepreneurial activity.” The Hoboken Hub would be an activity in which Stevens would play a key role both in advancing entrepreneurship at Stevens and in bringing concomitant benefits to the larger Stevens community including a number of interested public and private entities. One benefit could be the creation of a near campus location for start-ups modeled after the Cambridge Innovation Center (see: www.cictr.com). The ERC’s reaction to the concept of a “Hoboken Hub” was definitely positive subject to careful examination and planning, especially in regard to the role of Stevens and its impact on Stevens.

- **Start-Ups.** There are at least two broad categories of campus start-ups, first, research intensive start-ups usually involving faculty as founders (often including graduate and post-doctoral students), and second, student initiated companies often times offering internet-based services. There is certainly some overlap in practices and procedures in implementation of these two as they evolve; however, there are distinctive patterns which should be recognized pertaining to each. Accordingly these distinctions would need to be recognized and accommodated as start-up activity is promoted in the above referenced Startup Support function within OIE.

- **Licensing Office.** Relative to the recommended Technology Licensing Office, it would appear that there is a need for an experienced technology licensing individual to augment the invention disclosure handling and patent filing expertise which already exists. One of the early tasks for this individual should be to review Stevens licensing practices to insure that they are in keeping with best practices in other universities.

- **Development.** Stevens' development office should be cognizant of interest and opportunities for philanthropic support for entrepreneurship purposes. Hence good communication between development personnel and the OIE would be expected.
- **Communications.** The OIE should make exceptional efforts to effectively advertise and communicate all I&E programs, activities, and events. Likewise, rules and regulations must be clear, transparent and readily available. It was apparent that existing programs have not been promoted well and there needs to be increased focus on marketing the various efforts. For example, the ERC interviews indicated that the NJ Meet-up was only promoted in the Babbio Building, faculty were unaware of the availability of the Entrepreneurship Minor, and faculty were likewise unaware of the NJ Meet-up which brings 150 entrepreneurs onto campus each month.
- **Heritage.** Stevens has a longstanding and proud history. Stevens should put more effort in educating its students about what Stevens stands for, and about its rich intellectual past and successful alumni. In brief, Stevens should devise means to convey to students the heritage of their institution.
- **Education.** The ERC education-related recommendations are targeted at providing students from all academic disciplines with innovative and entrepreneurial knowledge and skills. For example knowledge of basic business models and the essential skills of problem solving, ability to communicate effectively, and teamwork are all elements which pay dividends in entrepreneurial undertakings. Relevant questions to be considered in the design of the educational program are:
 - What are the most essential skills to become more innovative and entrepreneurial?
 - What kind of environment, curricula, and activities are essential to enhance these skills and stimulate innovation?
 - How can the identified environment, curricula, and activities be implemented and assessed?

- **Faculty Evaluation/Recruitment.** It is reasonable that if entrepreneurship is to assume a central role at Stevens, then contributions by faculty to entrepreneurship should be considered as part of faculty evaluation. Likewise, predilection toward entrepreneurship should be a positive consideration in recruitment.
- **OIE Personnel.** The ERC wishes to note that a new organization does not necessarily address every issue or solve all the acknowledged problems. Without question, the skill levels of personnel within OIE will be the key to the performance of the organization. ERC members would be glad to help create or review “position descriptions” that may be helpful to Stevens in the future.
- **Re-evaluation.** Once Stevens has acted in response to this report, the ERC also recommends that the OIE’s organization effectiveness be formally re-evaluated within two years.

Acknowledgments

The ERC was impressed by the extensive work and serious commitment of the IRC in putting together the self-study. The ERC greatly appreciated the frank and informative discussions held with the IRC, the deans, faculty, and students. The Stevens staff support to the committee has been excellent. The ERC is especially appreciative to President Farvardin for sharing his vision for Stevens, his openness to the ERC, and his hospitality during the ERC visit on campus.

Report Submittal

This report is submitted to President Nariman Farvardin by unanimous concurrence of the External Review Committee:

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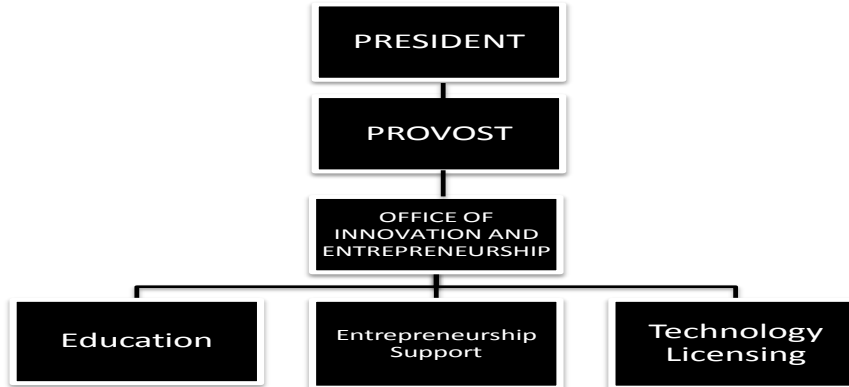
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Appendix – OIE Organizational Chart/Missions



- Education** – Inculcate entrepreneurship skills and training throughout the four-year educational experience;
- Entrepreneurship Support** – Facilitate connections between Stevens students, faculty, staff, and administrators and the outside world through mentorship, networking, showcasing, and start-up assistance to maximize entrepreneurial start-ups;
- Technology Licensing** – Conclude licensing agreements, secure IP protection, manage Stevens IP portfolio, and assist in negotiations for industrial contracts.