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# ENTREPRENEURSHIP **THE PRINCETON WAY**

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REPORT OF THE  
PRINCETON ENTREPRENEURSHIP ADVISORY COMMITTEE

 **PRINCETON UNIVERSITY**

May 2015

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## Executive Summary

At the beginning of 2014, Provost David S. Lee '99 created the Princeton Entrepreneurship Advisory Committee (PEAC), a balanced group of faculty, students, administrators, and alumni with expertise in this area. The committee was asked to develop a bold, long-term vision of how the University can best support its student, faculty, and alumni entrepreneurs in a way that furthers Princeton's educational mission and is rooted in its strengths as a liberal arts institution and as a leading research university.

Entrepreneurship the Princeton Way starts with *how we define the terms*. In contrast to standard definitions and typical focus by a university, we think of "entrepreneurship" as the "initiation of transformations through risk-taking actions and value-creating organizations." And we view the term "entrepreneur" not merely as an occupation but instead as a mindset. Entrepreneurial actions take place not only by the founding of start-ups, but also by creating nonprofits, joining early-stage companies, and innovating within large corporations, governments, and nongovernmental organizations, all of them with the common thread of taking actions to make significant, positive changes by way of a daily process that pushes, pivots, and persists.

Entrepreneurship the Princeton Way also has a specific strategic inspiration: *to prepare students and faculty to achieve the highest standard of excellence of entrepreneurial activities as a service to the nation and all nations.*

Multiple organizations across campus have started to create entrepreneurship programs in recent years, with early success, growing momentum, and promising potential. But by Princeton's standard of excellence in everything it chooses to do, much more remains to be done. After extensive outreach, comparisons with peer institutions, and detailed self-study, we hereby make three sets of recommendations.

1. *An ecosystem of entrepreneurial alumni:* We realize the importance of building an ecosystem within our community of Princetonians on campus and beyond, and we will draw on the expertise of the experienced entrepreneurs among our famously loyal alumni to create an accessible network for Princeton's students and faculty. Entrepreneurship the Princeton Way will invest in the long-term entrepreneurial potential of Princetonians and build the most-effective entrepreneurial alumni engagement with students and faculty.
2. *A certificate program that ties into and amplifies Princeton's liberal arts education:* we believe that Entrepreneurship the Princeton Way will amplify what Princeton stands for: providing a broad-minded liberal arts education that will contribute to the common good and creating innovative research that may translate into societal impact. Providing outlets for entrepreneurial experiences can enhance our core mission of spurring creativity and help students build the character they will need for taking risks, following their passions, and persisting through the inevitable failures that are necessary parts of entrepreneurial activity.
3. *A physical space for entrepreneurs to meet each other.* Entrepreneurship is fundamentally about individuals who embrace uncertainty, meet the intellectual and practical challenges with perseverance, and who bootstrap each step of the way. Renting an easily-accessible incubator space in the near term and providing an on-campus building dedicated to entrepreneurship in the long term will provide a physical anchor for all entrepreneurship programs and help advance the University's teaching and research mission.

Supporting details will be presented for each of the above recommendations in Section 3. Collectively, they will *expose* many of our students and faculty to entrepreneurship, *enable* those who choose to pursue entrepreneurial activities, and *enhance* the entire Princeton community. Some of the positive impact will become visible immediately; other areas of it will naturally take much longer. But with serious commitment and careful execution, we believe that by 2025, Princeton can become widely viewed around the world as a leading university in entrepreneurship with a unique and distinctive character.

## Section 1: Vision

### A. Why and Why Now?

We explore the vision and mechanisms of entrepreneurship at Princeton because entrepreneurship is becoming integral to the University's teaching and research mission.

- *Education of the mind and broadening of students' pathways toward contribution:* Many of the twenty-first century's top-notch students are part of the entrepreneurial generations, which believe they can make the world a better place through entrepreneurship. As the best undergraduate institution, Princeton must continue to evolve its education environment and match the interests and needs of its students, continue to ensure diversity among incoming students' intellectual inclination, and continue to provide graduating students with a wider range of choices for contributing to society.
- *Service and leadership:* Societal service and global leadership, as in Princeton's informal motto, now often require entrepreneurial spirit and capability.
- *Research with impact:* In many academic disciplines today, the translation of fundamental research into impactful innovation takes the path of entrepreneurship, leading to boosted productivity, higher standard of living, and a healthier society.

Here on campus in the past few years, we have seen surging undergraduate demand for entrepreneurship programs, enthusiastic alumni support for entrepreneurship activities, and increasing faculty interest in entrepreneurial endeavors—all of them leading to successful and oversubscribed pilot programs. We have also witnessed a strong national trend of building entrepreneurship on campus and a window of opportunity in the New York entrepreneurship ecosystem.

### B. What Is Entrepreneurship?

We take the following as our working definition of entrepreneurship: **the initiation of transformations through risk-taking actions and value-creating organizations**. The definition is much broader than, say, "commercialize research in science and engineering," narrower than "think about something new," and related to but distinct from "invention, passion, creativity, industry collaboration, and patent licensing."

Entrepreneurship can be about *high-technology* start-up or *social* start-up. Entrepreneurs may found *new* ventures or join *existing* start-ups. Or they can work from within big corporations, governments, and nongovernmental organizations. And they can pursue entrepreneurial activities while in college or at any point in their career. Indeed, many successful entrepreneurs, even according to narrower definitions, start their careers working in large corporations. *Entrepreneur* is not a job title but a mindset.

Living out the true meaning of this mindset is challenging: building a complete, stable and experienced team, navigating through the intellectual maze of market dynamics, constantly redefining the problem statement and pivoting around "who are our customers," bootstrapping with significantly limited resources toward building at-scale organizations, and embracing uncertainty and rejection every step of the way. Entrepreneurship is about teams of individuals who push, pivot, and persist each day.

### C. What Is Entrepreneurship “the Princeton Way”?

Entrepreneurship at Princeton should be carried out in the Princeton way: it should have objectives and approaches that amplify rather than weaken Princeton’s rich heritage, and it should have plans and priorities that broaden rather than dilute Princeton’s unique strengths and contributions. “The Princeton Way” starts with how we define the terms entrepreneurship and entrepreneurs. And when properly executed, Entrepreneurship the Princeton way will have the following **defining characteristics**.

- Make positive social, economic, and cultural impact and contribute to the common good through entrepreneurial service and global leadership.
- Train the mind in the areas of creativity, innovation, and discovery of pathways from ideas to at-scale impact.
- Train character in the areas of taking risk, thriving under uncertainty, and persistence through failure.
- Broaden the range of career choices for students and intellectual diversity in undergraduate recruiting.
- Promote interdisciplinary research across campus, resulting in translational impact. Enhance faculty recruiting and retention in many disciplines.
- Take advantage of and further strengthen alumni relations and development.

In particular, Entrepreneurship the Princeton Way also has the following **primary strategic inspiration**: *Entrepreneurship the Princeton Way should achieve the highest standard of excellence of entrepreneurial activities as a service to the nation and all nations, and enhance the liberal arts education environment through the entrepreneurial mindset.*

In contrast, there are many other possible objectives and approaches, some of them indeed taken by other universities or organizations, such as focusing on regional economic development and job creation, targeting primarily monetary success, justifying academic research through commercial ventures, obtaining direct investment from endowment to university start-ups, maximizing the institution’s financial return through investment in students’ or faculty’s current companies, encouraging students to drop out of college, or putting most of the actions into business school programs. We do *not* recommend those as Princeton’s objectives or approaches.

*As the most important tactical approach of Entrepreneurship the Princeton Way, we should build the most-effective entrepreneurial alumni engagement with students and faculty.* A vibrant ecosystem is often cited as the single most important factor for success in entrepreneurship, and we have been challenged with the lack of ecosystem in Central New Jersey. Our response is to build a triangle of ecosystems, centered around an alumni ecosystem and supplemented by a geographic ecosystem and a funding ecosystem.

- An alumni ecosystem consisting of global links of Orange and Black: mobilizing the entrepreneurial Princetonians to work closely with students, faculty and staff on campus.
- A geographic ecosystem: tightening the relation with both the entrepreneurial resources in New Jersey and the increasingly vibrant New York ecosystem.
- A funding ecosystem: building a variety of funds within the university operation for students, alumni and faculty’s entrepreneurial activities while encouraging the creation of an alumni Band of Angels operating outside of university.

Furthermore, entrepreneurship can be an intellectually thrilling process. Learning entrepreneurship and associated disciplines “the Princeton Way” will orient students’ entrepreneurial skills and mindset to the recognition and creation of genuine value in order to serve the common good. This orientation is best cultivated by being situated within a liberal arts education of the highest caliber.

We should evaluate the long-term impact of entrepreneurship at Princeton through the angles of building ecosystem and connecting to the liberal arts education environment. We caution against using simplistic numerical metrics or relying on a short time horizon to evaluate initiatives that aim at changing the long-term culture of an institution and investing in the long-term potential of its people. In particular, the number of start-ups founded by Princetonians will *not* be the best metric given our broad definition of entrepreneurship. One of the ways to evaluate our efforts will be to see whether, by 2025, Princeton is widely viewed by students, faculty, and communities of entrepreneurs around the world as a leading university in entrepreneurship with a unique and distinctive character.

#### **D. What Are the Principles behind Our Programmatic Recommendations?**

As summarized above and detailed in Section 3, we make three sets of recommendations based on the self-study summarized in Section 2. Across all of the recommendations, our approaches are based on the following five **principles**.

1. *Expose many, enable a few, enhance for all.* Even when broadly defined, entrepreneurship is a path that only a fraction of our students and faculty will pursue. But being exposed to opportunities in entrepreneurship will plant the seed in their minds and help them make well-informed choices throughout their careers while becoming aware of a wide range of ways to contribute to society.
2. *Invest in Princetonians’ long-term entrepreneurial potential.* In the spirit of who before what, the team of entrepreneurs is itself often more crucial than is any idea or product. True entrepreneurs ride through the ups and downs of cyclic market conditions and thrive past crashes of markets that invariably happen at the peak of start-up fad. Similarly, Princeton as an institution should take the long-term view on the impact of its entrepreneurship programs.
3. *Help students and faculty learn through hands-on practice.* Princetonians should not be led to underestimate the level of difficulty of entrepreneurship, especially in the starting of one’s own venture. Entrepreneurship is a daily struggle involving 99% frustration and 1% desperation. Students need to embed themselves in that environment and see firsthand what it takes. In the spirit of problems before solutions, the social network of entrepreneurs, among Princetonians and New Jersey/New York ecosystem, will help members learn how to differentiate among opportunities and identify the bottleneck problems they need to solve.
4. *Energize a diverse set of departments and organizations across campus.* Entrepreneurship the Princeton way can be realized only by being inclusive without becoming imperious. We should start with freshman year and include all the way to graduate students. In particular, while one could argue how much of the entrepreneurial mindset is nature versus nurture and grit versus skills, it certainly involves an appetite for risk, uncertainty, and failure that needs to be cultivated early on.

5. *Focus on bottom-up rather than top-down.* Unlike certain other initiatives in universities, entrepreneurship can thrive only through bottom-up initiatives. We should experiment with new programs in a pilot, pivot, try-again mode. One of the keywords in our working definition of entrepreneurship is *actions*, and so is our process of teaching about and encouraging entrepreneurship: by experimenting with new actions.

While some of the recommendations are essential for Princeton to catch up with the programs and resources above critical mass, each set of the recommendations also highlight how Princeton can take a leadership position in university-based entrepreneurship: creating the most vibrant entrepreneurial alumni ecosystem, establishing connections to senior theses, and building a physical space across disciplinary and organizational structures.

## Section 2: Current Status

Princeton University has come a long way since Ed Zschau taught its first entrepreneurship course in 1997. The undergraduate Princeton Entrepreneurship Club was formed in 1998, and the first TigerLaunch start-up competition was hosted the following year. In 2004, the first Innovation Forum was co-organized by Keller Center and the Office of Technology Licensing (OTL). In 2009, the Princeton Social Entrepreneurship Initiative (PSEI) was established by undergraduate students. The first Princeton hackathon was organized in 2011. Then, in 2012, the eLab summer accelerator was initiated by Keller Center, and the Intellectual Property Acceleration Fund by OTL. An increasing number of students and faculty have benefited from those programs.

Section 2A highlights four areas of existing programs at Princeton. In general, they have been doing well as individual programs and serving their target purposes with strong growth momentum. Considering the small number of faculty and staff running the programs, the impact per capita is remarkable. Princeton was also recently ranked by some media as having one of the top 10 entrepreneur programs in the United States. At the same time, most of the people outside the University and even many people on campus do *not* know the full extent of our *existing* offerings. Some of the current programs have become severely limited by lack of resource availability—often to the point of turning away more than 50% of worthy student or faculty applicants. Across all the dimensions—from curricular to cocurricular and extracurricular and from on campus to ecosystem and alumni engagement— there is significant potential yet to be fully realized.

Most important, we believe much remains to be done for entrepreneurship at Princeton to meet and exceed the *Princeton-worthy standard of excellence*. Princeton University does an outstanding job in what it chooses to pursue. And Entrepreneurship the Princeton Way needs the kind of long-term planning, resource support, and serious attention that will make it a shining feature of the University.

Before making recommendations toward that goal, we started with self-study, peer comparison, and input gathering from students, faculty, and alumni.

### A. What Programs and Resources Do We Currently Have?

#### 1. Entrepreneurship Annual Competition

- *TigerLaunch* by Entrepreneurship Club and PSEI (undergraduates), including social entrepreneurship track, \$61,000 in awards
- *Princeton Pitch* by Entrepreneurship Club and PSEI (undergraduates), \$3,500 in awards
- *HackPrinceton* by Entrepreneurship Club (undergraduates, open to external participants)
- *Innovation Forum* by Keller Center and OTL (faculty/graduate students), \$30,000 in awards
- *Intellectual Property Acceleration Fund* by OTL (faculty), \$750,000 in *research funding*

Each of the aforementioned competitions has become very popular in recent years, attracting large numbers of high-quality participants. However, crossing “the valley of death” from initial idea or prototype to traction with investors and customers often remains a challenge.

#### 2. Connections and Events



- *Patent filing and licensing*: Activities by OTL, including licensing of technology invented by Princeton faculty and students, as well as interactions with industry partners by various research centers to facilitate the transfer of Princeton innovation to the wider community
- *Celebrate Princeton Invention*: An annual event attended by Princeton faculty, students, and staff as well as Princeton's investment, legal, and industry collaborators that showcases innovations and the Princeton researchers involved in technology transfer—from invention to disclosure, patenting, and licensing
- *TigerTrek by Entrepreneurship Club*: There are two tracks: a one-week program in Silicon Valley, including a 200-alumni dinner, and a one-day program in New York.
- *Week-long Start-up Camp during intersession and HackClasses by Entrepreneurship Club*
- *Seminar, panel, and workshops*: Idea Factory by Entrepreneurship Club; TEDxPrincetonU by PSEI; speaker series/panel by Keller Center, Entrepreneurship Club, PSEI, and Career Services; E-Workshops by Keller Center; reunion alumni events by Princeton Entrepreneurs' Network and Entrepreneurship Club; alumni events by Career Services
- *Start-up career connections*: Career Fair and Nonprofit Fair by Career Services; summer internship matching by Pace Center, Keller Center, and Office of International Programs; Princeternship Program by Career Services

The participation trend has shown surging interest. As examples, Entrepreneurship Club newsletter subscription went from 800 in 2012 to 1,600 in 2014; TigerLaunch entries went from 7 in 1999 to 110 in 2013; and HackPrinceton participants grew from 100 in 2011 to 800 in 2014. However, there remains a critical need to further strengthen the ties with the local ecosystem, including industry and alumni mentors. Furthermore, most of the interests are geared toward undergraduates, with room to grow programs targeting faculty, graduate students, and postdocs.

### **3. Accelerator/Incubator:** *eLab summer program and academic-year program* by Keller Center

Teams of mostly undergraduate students with diverse backgrounds across campus apply each February with their start-up ideas. Depending on the funding availability in each year, only some of the support-worthy teams, as deemed by a panel of experts, can be supported. A 10-week stipend and on-campus accommodation are provided for the selected teams but not actual seed funding for start-ups. The teams share a small co-working space in Engineering Quad H-Wing, go through a rigorous program run by entrepreneur veterans, interact with mentors, and present during Demo Days at Princeton and in New York in mid-August that are attended by about 400 people.

During the past three summers, about half of the 20 teams supported by eLab have turned into actual start-ups. In 2014, Summer Accelerator expanded into a yearlong (part-time, no-stipend) incubator program. However, because there is no stable financial support for eLab, the long-term viability of this successful program remains uncertain.

### **4. Entrepreneurship Courses:** The first 10 of the following courses were offered in 2013/14.

- EGR 201: Fundamentals of Entrepreneurship
- EGR 392: Creativity, Innovation, and Design
- EGR 437: Innovation Process Leadership

- EGR 491: High-Tech Entrepreneurship
- EGR 492: Radical Innovation in Global Markets
- EGR 494: Leadership Development for Business
- EGR 495: Special Topics in Entrepreneurship
- EGR 497: Entrepreneurship Leadership
- EGR 498: Social Entrepreneurship
- COS 448: Innovating across Technology, Business, and Markets
- ECO 417: Venture Capital and Private Equity Investing
- ENV 324: Environmental Entrepreneurship
- MAE 437: Introduction to Innovation Process Management
- MAE 445: Entrepreneurial Engineering
- ORF 492: Leadership and Organizational Dynamics
- SOC 214: Creativity, Innovation, and Society
- EGR 493: Managing Entrepreneurial Ventures

There is a strong enrollment trend: all of the courses currently offered are heavily oversubscribed. In the Class of 2014, 238 students—66% of them from outside the engineering school—took at least one of the Keller Center EGR entrepreneurship classes. EGR 491, the longest-serving course in the list, has educated 1,700 Princeton students about entrepreneurship during more than 30 semesters. Taught with dedicated energy and pedagogical skills, often by veteran entrepreneurs including those holding the James Wei visiting professorship, most of the courses have project components and examine useful case studies. Many students have cited these courses as transformative in their Princeton experience.

At the same time, many courses offered in a wide range of departments—from Anthropology to Architecture, History, Politics, Psychology, and Sociology—as well as through the Woodrow Wilson School and Computer Science, Economics, and Engineering—may not be sufficiently widely recognized in their value for budding entrepreneurs. There are still holes in the coverage of topics and lack of a long-term plan for a structured curriculum.

## **B. How Do We Compare with Peer Institutions?**

Almost all of our peer institutions have made significant investments and major upgrades in their entrepreneurship environments. Following is a partial list of recent announcements in 2013/14:

- Harvard: Blavatnik Entrepreneurs Fellow/Accelerator, XFund
- Yale: Yale Entrepreneurship Initiative's Innovation Fund
- MIT: Many new initiatives from the Office of the President
- Columbia: SoHo incubator, Columbia Entrepreneurship office
- Cornell: The new Cornell New York campus focus on entrepreneurship
- Penn: Pennovation Center at the new South Bank campus
- Caltech: New entrepreneurship courses, hiring, and venture fund
- Carnegie Mellon: Open Field Entrepreneurs Fund, Greenlighting Startups, Project Olympus
- Dartmouth: Office of Entrepreneurship and Technology Transfer
- NYU: Leslie Entrepreneurs Lab incubator
- UC system: Its first, large-scale venture fund

Some of the initiatives in the list are happening in the city of New York. Indeed, New York's entrepreneurship environment in general is booming: it has become among the most vibrant in the country in the past several years.

We also caution that not every initiative pursued at other universities would fit the needs and conditions at Princeton. Jumping onto the bandwagon of the trendy theme of the day is not what motivates us to explore and define entrepreneurship the Princeton way. There can be too much (narrowly defined) entrepreneurship on campus, although we currently have the opposite problem at Princeton.

We should and will learn from our peers' experiences. The top two lessons we learned involve space and staff.

- *Space:* A physical place to create a community of entrepreneurship and run vibrant programs is very important. An example of the contrast we see is the space allotted to incubator and accelerator programs on or near campus: As of summer 2014, Princeton has only 1,500 square feet, whereas Cornell has 364,000, Penn 200,000, Berkeley 108,000, Harvard 30,000, Stanford 12,000, Yale 7,700, NYU 6,000, and Columbia 5,000.
- *Staff:* At-scale execution of entrepreneurship programs is labor-intensive and requires sufficient staff size. For example, a mentorship network is universally recognized as an essential anchor of all entrepreneurship education programs and yet is among the most challenging ones to execute right. MIT Venture Mentoring Service's success (132 mentors advising 1,400 entrepreneurs in 800 ventures—with 69 executed—since 2000) was achieved through rigorous screening, regular check-in, and a culture of quality, collegiality, and trust maintained through 5.5 full-time staff and many volunteers.

When compared with other institutions, we identified the following main **areas of weakness** in Princeton's current environment, which in turn motivated our recommendations in Section 3.

- Lack of a strong mentorship network or local ecosystem immersion; relatively weak alumni involvement
- Lack of easily accessible space for entrepreneur interactions
- Insufficient resource and funding support, including those for cocurricular activities, accelerator programs and commercialization of intellectual property
- Coverage holes and limited full-time-equivalent support for curriculum in entrepreneurship
- Relatively rigid policies on taking leave for entrepreneurship; strong risk aversion in student career planning
- Lack of consistent "branding" or coordination within the University community

### **C. What Have Our Students, Faculty, Staff, Alumni and the Community Told Us?**

During the self-study phase in the first half of 2014, we reached out to all constituencies by way of multiple rounds of surveys, focus groups, one-on-one interviews, events, and online input gathering. The following summarizes key insight from the data gathered.

We start by highlighting the facts that students, faculty, and alumni usually have very different types of day-to-day operation, different typical paths and procedures, and different most-critical challenges and pressing needs in their entrepreneurship activities. What works for one of the three demographics may not work well for the other two.

### **Input from Students**

Our current students wonder whether it is possible to expose the future Jeff Bezos, Eric Schmidt, or Meg Whitman to the opportunities of entrepreneurship early on and to encourage the future Wendy Kopp to work from their senior theses and create social entrepreneurship entities like Teach For America.

- In a survey of 171 current students interested in entrepreneurship, 37% of respondents reported developing an interest in entrepreneurship prior to arriving at Princeton, 42% during their freshman and sophomore years, and 16% during junior and senior years. Forty-seven percent said their interest in entrepreneurship was related primarily to science or engineering, 36% to social issues, and 17% other fields. Seventy-nine percent said their level of interest in entrepreneurship had either increased or greatly increased from the first time they were on campus; 16% said their level of interest had not changed.
- In another survey of 164 undergraduates interested in social entrepreneurship, most respondents said they regarded social innovation or service as an integral part of their Princeton experience, and 57% credit Princeton with helping develop that drive. Nonetheless, 63% said the University does *not* provide sufficient opportunities to pursue entrepreneurship in conjunction with their academic life, and 28% of those further said there is a broadly discouraging atmosphere on campus rather than a specific deficiency or disappointing experience. About 28% cited academic pressure as reducing the time available to work on entrepreneurial projects, and a similar percentage said entrepreneurial activities cannot be counted as independent work, although about two-thirds of the overall survey population did not know about the possibility of curricular flexibility such as independent concentration.
- The top recommendation from students is the provision of a central, prominent space for entrepreneurship that would give students and projects exposure and help connect students with the entrepreneurship ecosystem so they could grow teams.

### **Input from Faculty**

Similar to the emergence of federal research sponsorship in the 1950s, when some researchers started to include research proposal development as part of their academic life, now spinning out research to “spin in” the impact is becoming an important opportunity for researchers in certain fields.

As demonstrated through the iCorp entrepreneurship program for translational research, recently established at the National Science Foundation and the National Institutes of Health, entrepreneurship can also sharpen and strengthen fundamental research itself. We have seen numerous such cases at Princeton too. Recent successes range from chemistry research that turned into important drug development companies to a computer science breakthrough that enabled a \$2.4-billion start-up to transform the data storage industry, and from an applied mathematics PhD candidate’s algorithms’ finding their way to 5 million mobile phones—within one year of launching the start-up—to a Woodrow Wilson School faculty’s social science start-up that used big data to enhance political science’s impact on national policy.

For many Princeton departments, recruiting and retaining an increasing portion of stellar faculty depend on cultivating a dynamic entrepreneurship environment on par with the environments of our peers, such as Stanford, Harvard, MIT, and Berkeley, which are widely perceived as more entrepreneurship friendly than Princeton, as well as Yale, Penn, Columbia, and Cornell, which have publicly and significantly stepped up their support of entrepreneurship in recent years. In addition to sharing many common characteristics, each of the four fields of information technology, biotech, material and device, and social sciences also has unique requirements in the entrepreneurship environment they need.

Of 38 faculty in all four divisions of the University who responded by entering their input either on the survey website or through several rounds of small-group lunch discussion, 95% say entrepreneurship should become part of Princeton's culture, 95% support more cocurricular programs in entrepreneurship, 82% suggest connecting entrepreneurship to independent work, 76% hope to see more extracurricular programs in entrepreneurship, and 66% support a curriculum in entrepreneurship.

### **Input from Alumni**

Alumni represent a unique strength for Princeton's plan for entrepreneurship support. In particular, Princeton has a growing population of alumni working in the broadly defined entrepreneurship ecosystem, many of whom have become highly successful. The University needs alumni support for current students and faculty, and should support young alumni living the entrepreneur life to cultivate an entrepreneurship ecosystem and advance the University's teaching and research mission.

Hundreds of alumni have communicated to PEAC through events and one-on-one conversations. In addition, 148 website responses were received from alumni: from the Class of 1950 to the Class of 2014, including 32 from classes in the 1990s and 24 from the classes of the 2000s. They came from 36 different departments, the largest one being History, and the second largest, the Woodrow Wilson School. Overall, 83% of the website input came from disciplines other than engineering. In summary, we learned that:

- About 94% of respondents want to see entrepreneurship become part of Princeton's education and experience in the future, which is consistent with what we heard from students and faculty.
- In terms of their own Princeton experience, 77% said that as students here, they did *not* have sufficient entrepreneurial opportunities, and 52% said the Princeton experience did *not* inspire or prepare them for the entrepreneurial activities they undertook later in life. In contrast with responses from current students, those statistics demonstrate the progress the University has made in recent years, but they also point out alumni's overall impression that we need to update through active outreach.
- As many as 85% of respondents volunteered to help, yet only 28% are currently involved in Princeton's entrepreneurship activities. The difference of 57% presents substantial untapped potential and a significant opportunity for Princeton's future in entrepreneurship.

### Section 3: Recommendations

Informed by what we learned in the previous section, we make three sets of recommendations: an ecosystem, a certificate and a building, plus a recommendation on the structure of campus organizations. Some of these recommendations reinforce and expand existing programs, and others represent bold new steps. Some will enable Princeton to catch up with what our peer institutions have already accomplished, and others will put Princeton in a leading position via innovative programs. At the end of this section, we will walk through three examples of how all the recommendations can work together.

We have three distinct groups of Princetonians in mind: students (undergraduate as well as graduate), faculty (and, by association, postdoctoral research staff), and alumni (both recent graduates and those much more established in their entrepreneurial careers). Those three groups often have distinct pathways and styles of entrepreneurship, dissimilar challenges to face, and very different needs for support. The overall plan of Entrepreneurship the Princeton Way should be inclusive across all three groups.

The set of recommendations is neither exhaustive in its scope nor complete in its scale. Many of the recommendations are meant to be pathfinders. New need in the future will also lead to new recommendations. The rest of this section serves as a blueprint to be regularly updated, not a script to be followed verbatim.

#### A. A Triangle of Ecosystems

Entrepreneurship is fundamentally about teams of individuals executing through a bootstrapped, uncertain process. University entrepreneurship faces the challenge of incomplete and unstable teams. Mentorship, especially from alumni, is particularly important. Furthermore, there rarely is vibrant entrepreneurship at a university without a dynamic local ecosystem that it can tap into and in turn contribute toward.

##### **Alumni Ecosystem**

First and foremost, we should invest the resources necessary to build, grow, and make use of a user-friendly database of alumni with demonstrated entrepreneurial interest. Furthermore, we should recruit administrators whose full-time focus would be to help match entrepreneurially successful alumni with students and faculty. The goal is to establish a small, highly curated network of the ablest and most-dedicated mentors (alumni as well as non-alumni). Indeed, mentorship, especially when carried out through small-group events and one-on-one interaction, can become the most useful resource a university can provide to its entrepreneurs.

All universities with a vibrant entrepreneurship environment work closely with the ecosystem around it. Likewise, there is no entrepreneurship ecosystem without an anchor university in it. Entrepreneurship at a university can thrive only when the university and its local ecosystem form a strong bonding. We should institutionalize the currently experimental industry engagement events, which are monthly, small-scale, action-oriented series of events, each series focused on a specific industry vertical; featuring university faculty and students, active members of the local entrepreneurial ecosystem, and domain experts in large corporations.

In continuing efforts to place more new knowledge in the public domain and raise the level of on-campus support for entrepreneurship at Princeton, a new ventures associate would be hired to work in the Office of Technology Licensing. Entrepreneurship often includes patent licensing as an element but has a wider scope that includes team formation, customer validation, and fund-raising. Due to differences in culture, experience, and skillsets between academic research and startup operation, professors may not be the ideal business leaders of the ventures they co-found. It is often healthy, if not essential, for professors to work with partners with complementary interests and capabilities so that they can each contribute to the entrepreneurial process in ways that leverage their own strength. This position would fill a void universally suggested by entrepreneurial faculty as the most-critical help they could receive from the University, including management team recruitment, fund-raising strategy development and support, commercialization grant preparation, partnership development, and market analysis. This support will help faculty and students share important discoveries and breakthroughs with the world in service of the common good.

### **Local Ecosystem**

An alumni ecosystem alone might not be sufficient. For example, labor markets for entrepreneurship revolve around physical hubs. There has been tremendous growth in entrepreneurial activities in New York in the past several years, and the likelihood of persuading New York entrepreneurs to come to Princeton regularly is very low because the train ride is a significant barrier to ecosystem access. A Princeton incubator in New York would provide more than just a co-working space for Princeton startups; it would also be a hub that creates and runs programs and brings Princeton alumni, students, and faculty directly into the New York ecosystem.

Various possible growth opportunities can be considered for this space in the future beyond entrepreneurship. For example, a Semester in New York program could serve well as a highly synergistic and selective activity. A cohort of 20–30 students would be selected to participate in the program every semester. As part of Semester in New York, students would take two Princeton courses taught in the city and have the opportunity to pursue independent study. Additional courses needed to fulfill departmental requirements could be taken at a partner institution or via reverse commute. Executive education represents another possibility. Furthermore, such a site in New York might serve as a base for other Princeton departments that could greatly benefit from a presence in the city.

We also recognize the importance of having a supportive entrepreneurial ecosystem near the Princeton campus that furthers both our educational mission and local economic development. This ecosystem will include a critical mass of new ventures, a labor pool of engineers and product talent, and possibly the infrastructure to support new venture creation including investors and accelerators. We should not pursue creating a broad, undifferentiated, “me too” entrepreneurial ecosystem in the Princeton area, but create local centers of excellence in specific areas of new venture creation, perhaps building from the faculty’s areas of research or local industry. These local centers of excellence should rise to the level of being magnets for talent, to the point that an engineer focused on one of these spaces would prefer to live in Princeton versus Silicon Valley or New York, just to be near to our excellence in that space.

### **Funding Ecosystem**

Yet another complementary ecosystem is one enabled by entrepreneurship funding. Funding is not just about the financial resources provided but also about the people and their endeavors that such resources enable. Peer institutions have followed a wide range of funding models in their entrepreneurship programs. After exploring what would fit Princeton’s culture and take best advantage

of our strength, we recommend four types of funding be created: the first three operated by the University for alumni, students, and faculty, respectively, and the fourth one independent of but in liaison with the University. Other types of entrepreneurship-funding mechanisms can be further examined after we gain experience with the following recommended funds.

- **Alumni Entrepreneurs Fund.** With donations from three alumni, the Alumni Entrepreneurs Fund (AEF) was created in fall 2014 as a first-of-its-kind fund at Princeton to support young alumni entrepreneurs. It is modeled after Carnegie Mellon University's Open Field Entrepreneurs Fund and focuses on creating a culture around entrepreneurship at Princeton by providing young Princeton alumni who meet a set of criteria with matching seed funding up to \$100,000 in the form of a convertible note. Future returns from those convertible notes will be reinvested in the program to help sustain our entrepreneurship education efforts well into the future. . In keeping with the academic mission driving Princeton's entrepreneurship programs, recipients of the AEF are required to come back to campus to help educate current students through their own entrepreneurial experience. AEF increases the number of students engaging in entrepreneurial activities soon after graduation by helping them enter the ecosystem more effectively. More than the funding itself, mentorship from alumni to alumni and a community of alumni and students are the key benefits enabled by AEF.
- **Tiger Challenge—an annual signature entrepreneurship competition.** Entrepreneurship should be an intellectually exciting experience. The Tiger Challenge is designed to encourage Princeton students to step off the treadmill of their individual achievements and work in diverse teams to develop solutions to unanswered challenges. The Tiger Challenge will be an annual activity in which interdisciplinary teams of students select up to three unique challenge opportunities and then work to research, conceptualize, prototype, and test their solutions. Challenges must be wicked problems involving people-based, incomplete, and often contradictory requirements. The Tiger Challenge will add to the University's rich fabric by asking students to achieve as a team of diverse thinkers.
- **Princeton Start-up Assistance Fund.** The Princeton Office of Technology Licensing has been operating an Intellectual Property Accelerator Fund for the past four years with great faculty interest and success. However, experience and faculty input have shown that there is a complementary need to support the entrepreneurial activities of University-based start-up companies in areas such as business plan writing, market analysis, financial planning, and legal advice during fund-raising. We are therefore proposing the establishment of a pilot Start-up Assistance Fund. Entrepreneur faculty members will apply to the OTL by way of a short proposal and budget. The proposed Start-up Assistance Fund does not invest in companies or seek to make a profit for the University, and should be distinguished from a venture-type fund that invests directly in university-based start-ups like those at New York University (the Innovation Venture Fund), at the University of Michigan (Michigan Investment in New Technology Startups Program), and in the University of California system. The committee suggests that this type of venture fund for faculty-originated start-ups be examined in two years, after we gain more experience with the funds in this recommendation.
- **Princeton Alumni Band of Angels.** As another important way of creating a community of entrepreneurial Princetonians, the Princeton Band of Angels (PBA) would be an organization composed of Princeton alumni and parents interested in investing in early-stage companies. The companies would not have to be Princeton related, but Princeton-related start-ups would likely receive serious attention by PBA. The PBA would also provide an educational and networking forum—a model very successfully executed by the Harvard Business School Band of Angels, with its New York chapter becoming the largest angel investor group in New York in 2014. The PBA



would be governed and operated independent of the University and would be likely to start with local chapters in entrepreneurship hubs such as New York, Silicon Valley, and Boston.

### **Branding the Princeton University Ecosystem**

Entrepreneurship the Princeton Way represents a broad interpretation of entrepreneurship: one that encompasses the transformation of ideas into value-producing organizations and promotes understanding of how entrepreneurship can lead to positive social, commercial, and cultural impact. Princeton students will learn to find new ways of approaching the world's problems and of identifying opportunities in all fields of endeavor. Princeton entrepreneurship will engage students, faculty, and alumni and will contribute in a profound way to bettering the world.

To enable effective information sharing and consistent "branding," we should create, publicize, and maintain a one-stop-shop Web presence, (<http://entrepreneurship.princeton.edu>), a social media presence, and an interactive entrepreneurship community. We should create and publicize flagship events, especially an Entrepreneurial Alumni Conference. An effective, signature event for alumni and the University community as a whole could be a two-day, homecoming conference of entrepreneurial alumni. Similar to Many Minds, Many Stripes and the African American Alumni Conference, such an Entrepreneurial Alumni Conference would help raise awareness of Princeton's new initiatives in entrepreneurship and connect alumni with students and faculty. We should incorporate entrepreneurial activities into student and alumni awards. We propose the creation of awards that recognize different types of entrepreneurial success among students and alumni, e.g., high technology entrepreneurs, social entrepreneurs, entrepreneurship mentors, and impact to developing world through entrepreneurial activities. Some of these prizes can be presented at Opening Exercises and Commencement.

#### **B. A Certificate**

Both learning in class and learning by doing are important opportunities for Princeton students so they can become equipped and experienced in transforming ideas into value-producing organizations. Innovation and entrepreneurship, more recently combined with design thinking, are driving enormous social and economic changes that are shaping our collective future. The confluence of these disciplines is now an important part of understanding the world around us and as such belongs to a Princeton education. Learning entrepreneurship and associated disciplines "the Princeton Way" will orient students' entrepreneurial skills and mindset to the recognition and creation of genuine value in order to serve the common good. This orientation is best cultivated by being situated within a liberal arts education of the highest caliber.

Liberal arts education can help students to understand the challenges that society faces, and the languages, cultures and practices that shape how those challenges are framed and can best be addressed. And more than that: a very wide range of departments cultivate skills and habits of mind – from empathy to perceptiveness to rigorous analysis to historical context, from ethnography to journalism to design thinking – that can help make entrepreneurial initiatives successful. Our proposal is not that entrepreneurship should become the dominant frame in a liberal arts education. We propose that a liberal arts education can best frame the problems budding entrepreneurs try to solve, and best provide many of the skills they need to do so. To those who contend that entrepreneurship cannot be taught, we say that skills and practice can benefit all, whatever their innate talents and interests, especially when complemented by a range of "learning by doing" components; to those who contend that it should be extracurricular only, we argue that academic rigor and insight can help to guide future practitioners along socially productive paths.

We believe that Princeton has the opportunity to establish a distinctive approach to teaching and practicing within the emerging, and converging, fields of Innovation, Entrepreneurship and Design by leveraging our special set of academic strengths and our long history of social and economic impact. This is precisely because what many might regard as a weakness -- we do not have, nor do we expect to have, a business school or graduate professional programs in these fields -- is better understood as a great potential strength. Innovation, Entrepreneurship and Design “the Princeton way” will be founded on our rare combination of world-class excellence across science & engineering, humanities, and the social sciences. Successful Princeton entrepreneurs, in both social and commercial domains, have testified to the value of courses on ancient Greek democracy in classics and political theory in informing their theories of organizational change; on the Victorian novel, in shaping their understanding of human needs and wants for work in marketing; and of the history of the Industrial Revolution in understanding the power of disruptive technologies, to take but a few examples.

The certificate program we envision – a certificate being roughly the Princeton equivalent of a minor, available to students in any major to pursue -- will expose students to different ways of understanding, conceptualizing, and for some, building enterprises that create value through positive impact on society, whether through a commercial or social venture. To be sure, students will develop necessary skills through a set of practicing courses such as “Entrepreneurial Value Creation,” “Leadership” and “Scaling the Enterprise.” But they will do so while developing a contextual understanding of the social forces at work through courses such as “History of American Capitalism” and “Psychology of Decision-Making,” and more broadly, by developing an informed understanding of the social and global challenges to which Innovation, Entrepreneurship, and Design seek to contribute.

Based on broad-ranging discussions with faculty, students, and administrators, we believe that a certificate program of this kind would energize Princeton’s offerings in a uniquely visible and valuable way. Such a certificate could help integrate Princeton’s offerings across these areas within a liberal arts curriculum, provide students with clear pathways of learning in these areas, and enhance the visibility of Princeton’s distinctive perspective. In particular, a certificate program is a key guidance mechanism to help students navigate the Princeton curriculum, pulling together courses that they might not otherwise have seen, and illuminating the value of a wide but integrated plan of study.

The certificate would be based on a combination of existing, modified, and new courses—many of which have already passed the test of academic rigor suitable to Princeton and all of which would be based on accepted methodologies, peer-reviewed results, and recognized best practices. Sets of these courses would integrate established and emerging approaches to teaching innovation, entrepreneurship, and design-thinking methodology. An illustrative outline of a certificate program would consist of two tracks—entrepreneurship and design—both incorporating aspects of innovation. In each track, students would pursue:

- *Freshman seminars (optional)*
- *One introductory course:* two to be offered, one in each track
- *Two additional core courses:* to be chosen from a list of six, three in each track
- *Two contextual courses:* chosen from a list across the disciplines
- *Elective:* one additional course chosen from either the core or contextual categories
- *Entrepreneurship Workshops* on practical skills involved in the entrepreneurship process, organized as supplements to credit-bearing courses
- *Independent Work:* Inclusion of a substantial element in either a junior paper or a senior thesis or in a separate piece of independent work. Grading standards would be co-designed with

academic departments to be sensitive to the unique metrics in entrepreneurship and design that complement standard disciplinary research metrics.

- *Practicing Element*: A form of substantial practical experience in these areas, which may take a variety of shapes (to be approved by the program director), such as a practical element connected with the junior paper or senior thesis, an internship, an eLab, or founding or managing a commercial or social venture.

In addition, we recommend scaling up entrepreneurship internships and shadowing experiences. Summer internship in start-ups, especially early-stage ones, is among the most effective, most realistic ways students can be exposed to life as entrepreneurs. The current internship program offered by the Office of International Programs can meet only about 15% of the demand, and the Keller Center is revamping its Sponsored Startup Internship program to provide funding so that through a structured program, students can join very early-stage start-ups in New Jersey, the city of New York, and Silicon Valley. In addition to summer internships, a program of shadowing of entrepreneurs during break weeks also could be created leveraging the alumni and mentors network. For internship as well as full-time job, entrepreneurial opportunities often have their own timeline behind the typical timeline for large corporation recruiting. Working with Career Services, we should establish a recruiting schedule for startups later in spring and widely advertise that to students.

We also recommend scaling up TigerTrek trips by a factor of three and enhance funding support for eLab Summer Accelerator. As a very successful and popular program that exposes students to the world of entrepreneurship through visits, meetings, and talks by entrepreneurial leaders, the Entrepreneurship Club conducts two or three treks to New York and one to Silicon Valley each year. Current demand for the Silicon Valley trek alone is 10 times the available number of spots. Similarly, eLab summer accelerator has proved to be a highly effective way to expose students, undergraduates as well as graduate students, to the life of entrepreneurs through an intensive, hands-on experience. And yet there is no stable funding for eLab and the fate of this program is uncertain each spring.

Finally, we should consider facilitating one-semester leave for undergraduate and graduate students to pursue entrepreneurial activities, with an option for credit. Our approach is to combine theory with practice and to unite academic learning with practical execution. For the knowledge students acquire while on leave and during internships, we hope there are practical applications as well as opportunities to earn academic credit from such learning. We propose that the Office of the Dean of the College develop a one-semester leave policy for sophomores, juniors, and seniors to allow them to pursue entrepreneurial activities. Students with advanced standing will be more easily approved. Credit for entrepreneurial activities during the one-semester leave can be awarded based on field study or study abroad models, with students writing a paper or completing a project to show what they have learned.

### C. A Building

Incubators are not about the spaces themselves. They are about the people who interact in those spaces. From what we have learned about our current programs and those at peer institutions, it is essential to have an anchor space with a vibrant community where entrepreneurs meet each other and where dynamic programs are carried out regularly. We believe that two types of incubator infrastructures will be required to enable the broader vision of the PEAC recommendations to be realized. The long-term solutions to those needs will have to tie in with the University's overall, long-term space planning.

- On-campus incubator space for Princeton University entrepreneurial activities. Also in-dorm entrepreneurship corners for more-informal programs (i.e., maker/tinker space for students).

- Near-campus incubator space for wet-lab-based, Princeton-originated entrepreneurial activities

For the first infrastructure piece, we examined a variety of choices and then targeted three possible in-town locations. After detailed examination of the choices by the committee and University real estate experts, we recommend the establishment of a near-campus incubator space in Princeton downtown as an intermediate solution in the near term, before identifying an on-campus, conveniently located, dedicated building where all entrepreneurship-related educational programs can be housed.

Complementary to the above, we also recommend to explore renting an off-campus incubator space for wet-lab-based entrepreneurial activities. This proposed wet-lab incubator is a turnkey incubator for biotech start-up companies involving members of the University community that will foster and facilitate the ecosystem of innovative biotech entrepreneurship. The incubator would benefit the University mission in the following ways.

- Enable collaborations among Princeton faculty, students and industry. A Princeton-biotech incubator space would greatly lower the barrier to the development of useful products from basic Princeton research in the physical and biological sciences and bring tremendous scientific benefits to society at large as well as the Princeton campus.
- Serve as a major tool in bringing to and retaining at Princeton the best researchers in the physical and biological sciences, furthering our research and education mission and enabling us to remain on a par with peer institutions that have established similar incubator resources for their faculty and students, e.g., Harvard, Stanford, MIT, Berkeley.
- Provide many jobs within the local economy and in doing so would further demonstrate the value of a world-renowned research university to the broader Princeton and central New Jersey communities. Boston and Bay Area successes in developing biotech ecosystems were built on the outgrowth of strong university research. Given the high population of scientists in the New Jersey area, a biotech growth component near Princeton would be welcomed broadly.

#### **D. Organizational Structure**

For entrepreneurship programs—both existing and new ones—to flourish, the teams that drive their execution constitute the most important element. There is a delicate balance between bottom-up and nimble operations by different campus organizations and coherent coordination across them for maximizing the aggregate impact. We propose a division of labor whereby

- Execution of most of the specific programs continues to be carried out by existing entities.
- The overall coordination is facilitated through a new council.

We recommend the creation of the Princeton Entrepreneurship Council, a loosely confederated body to help coordinate existing, autonomous organizations running entrepreneurship programs at Princeton University. Reporting to the provost, the council would provide support in terms of cross-campus liaison and university-level policy discussion. Existing organizations would maintain their current structures, resources, and missions and would execute most of the new programs recommended here. That way, a balance between bottom-up execution and campus-wide coordination could be maintained. Led by a faculty chair, the council would serve two types of functions:

- Advisory

- Advise on University-wide entrepreneurship policy making (e.g., the entrepreneurship fund for young alumni, leave policies for undergraduate and graduate students).
- Evaluate regularly the status of entrepreneurship at Princeton, adjust current recommendations, and make new recommendations.
- Coordination
  - Maintain coherent university-wide branding.
  - Coordinate events organized by various campus organizations.
  - Coordinate outreach to alumni and local ecosystem and maintain a database of entrepreneurial alumni.

Council Members include faculty members appointed by the Provost (including the council chair):

- 2 from the humanities and social sciences
- 3 from science and engineering

as well as campus organizations' representatives as ex officio members: the staff or student directors of:

- Keller Center
- Pace Center
- Office of Technology Licensing
- Office of Undergraduate Research
- Career Services
- Princeton Entrepreneurship Club
- Princeton Social Entrepreneurship Initiative

Alumni Advisory Board to the Council: Given the importance of alumni in Princeton's entrepreneurship program, there will be an advisory board to the Council, consisting of about 10 alumni who have rich experience in various aspects of entrepreneurship, with a balance across sex, ethnicity, age, location, and field.

Other entities on campus in constant liaison with the Princeton Entrepreneurship Council include: Alumni Association, Business Today (undergrad), Office of Development, Office of Corporate and Foundation Relations, Advertise This (undergrad), Davis International Center, Office of the Dean of the Faculty, Office of Research and Project Administration, Office of General Counsel, Office of Communications, Vice Provost for Space Planning, Research Integrity and Assurance.

### **Recommendations Working Together**

These recommendations are neither exhaustive in scope nor complete in scale. Many of them are meant to be pathfinders toward full-scale programs. New need in the future will also lead to new recommendations. As entrepreneurs, we have to keep experimenting and adapt the plan as needed. Creating a culture and environment of entrepreneurship will be neither quick nor easy, and it will require experimentation and perseverance. But when properly executed, entrepreneurship at Princeton will expose our students and faculty to a different mode of thinking; it will enable those who choose to broaden their pathways toward serving the nation and all nations through entrepreneurship; and it will enhance Princeton's ability to make a positive difference in the world through its teaching and research.

These recommendations will also work together to reinforce each other's impact. As examples, consider three entrepreneurial Princetonians—undergraduate Alice, faculty member Brooke, and alumnus Chris in 2020—and how their experiences benefited from the recommendations given in parentheses.

- Class of 2020 student Alice took a freshman seminar on social entrepreneurship, which kindled her interest to pursue the certificate. Using the entrepreneurial alumni database, she is matched to an alumnus who has been a successful social entrepreneur and who introduces her to a sophomore summer internship at an existing nonprofit start-up. Upon returning to campus, Alice initiates her own social entrepreneurship venture with two classmates and starts using the near-campus incubator. Through the Princeton Band of Angels, the team obtains a first round of funding. Taking one semester of entrepreneurship leave, the student team creates the first product serving the target needs; and the initial impact on society gets recognized on Class Day, when Alice graduates and devotes herself full-time to the venture.
- Brooke invents a new medical device in her lab at Princeton. Through the help of new ventures associates and industry colleagues she met at industry engagement events, she pivots the idea a couple of times and finally discovers a pathway that will turn the research breakthrough into a commercially viable product. Using the faculty new venture fund and the wet-lab incubator, Brooke works with partners attracted to the project through the entrepreneurship website to launch the venture that may one day substantially reduce the cost of diagnosis in developing countries.
- Class of 2018 Chris has been on the TigerTrek and in the eLab program during the years at Princeton. Chris was unsure of the career path that entrepreneurs took and upon graduation, became a product manager in a large corporation. Two years later, after attending various events at the Princeton incubator in New York and talking to the entrepreneurship council, Chris decided it was the right time to pursue his own ideas. The first attempt failed because of lack of channels to target customers. Then at the entrepreneurial alumni conference, Chris finds another alumnus with complementary skills. The new team works closely with mentors and raises the first round of funding in part through the Alumni Entrepreneurship Fund. Now Chris becomes an adviser to a Tiger Challenge team back on campus while continuing to lead his venture.

For Alice, Brooke, Chris and many Princetonians, today and in the future, the exciting visions and bold initiatives set forth between the two covers of this report will become reality only through dedicated teams backed by serious resources from the University. Their execution will determine where Princeton will find itself in the area of entrepreneurship in decades ahead.

## Appendix

## A. About the Committee and Its Process

PEAC was formed by Provost David S. Lee '99 in December 2013 and started meeting in January 2014. It is a diverse group that consists of about 20 members, including faculty members, students, staff and alumni.

### Committee Members (over the period of January 2014 – March 2015)

- *Mung Chiang (Chair)*, Arthur LeGrand Doty Professor of Electrical Engineering, Director of Keller Center for Innovation in Engineering Education
- *Lynda Clarizio '82*, President of Nielsen US Media
- *Kimberly de los Santos*, John C. Bogle '51 and Burton G. Malkiel '64 Director of Pace Center for Civic Engagement
- *Catherine Dennig '15*, Undergraduate Student, Copresident of PSEI 2013–14
- *John Diekman '65*, Founder and Managing Director of 5AM Ventures
- *Eric First '14*, Graduate Student
- *Stephanie He '15*, Undergraduate Student, President of Entrepreneurship Club 2014–15
- *Cornelia Huellstrunk*, Associate Director of Keller Center
- *Christopher Kuenne '85*, Founder and CEO of Rosemark Capital Group
- *Sanjeev Kulkarni*, Professor of Electrical Engineering, Dean of the Graduate School
- *Melissa Lane*, Class of 1943 Professor of Politics, Associate Chair of Department of Politics
- *Kai Li*, Paul M. Wythes '55 P86 and Marcia R. Wythes P86 Professor in Computer Science
- *Lynn Loo '01*, Theodora D. '78 and William H. Walton III '74 Professor in Engineering, Associate Director of Andlinger Center for Energy and the Environment
- *David MacMillan*, James S. McDonnell Distinguished University Professor of Chemistry, Chair of Department of Chemistry
- *Adel Mahmoud*, Professor in Molecular Biology and Public Policy
- *Pascale Poussart (Secretary)*, Director of Undergraduate Research
- *Vivian Qu '14*, Undergraduate Student, Copresident of Entrepreneurship Club 2013–14
- *Jennifer Rexford '91*, Gordon Y. S. Wu Professor in Engineering
- *Gordon Ritter '86*, Founder and General Partner of Emergence Capital Partners
- *John Ritter*, Director of Office of Technology Licensing
- *Pulin Sanghvi*, Executive Director of Career Services
- *Peter Wendell '72*, Managing Director, Sierra Ventures

In spring 2014, PEAC operated its *self-study phase* through seven task forces.

- Task Force on Student Outreach: *Eric First, Pascale Poussart, Vivian Qu, Tim Lau (student helper)*
- Task Force on Faculty Outreach: *Adel Mahmoud, Lynn Loo, Jennifer Rexford*
- Task Force on Alumni Outreach: *John Diekman, Peter Wendell, Yo-Tzu (Yolanda) Yeh (student helper)*
- Task Force on Current Resources: *Catherine Dennig, David MacMillan, Tim Lau (student helper)*
- Task Force on Peer Institution Comparison and Local Resources: *Lynda Clarizio, Chris Kuenne, Kai Li, John Ritter, Max Bressler (student helper), Rishita Patlolla (student helper), Catherine Idylle (student helper)*
- Task Force on Design and Innovation: *Sanjeev Kulkarni, Gordon Ritter, Neeta Patel (student helper)*



- Task Force on Societal Impact: *Kimberly de los Santos, Melissa Lane, Robert “Trap” Yates (student helper)*

In summer and fall 2014, PEAC operated its *recommendation phase* through five task forces, each consisting of PEAC members and in some cases, additional members.

- Task Force on Mentorship, Alumni and Ecosystem: *Peter Wendell (Chair), Stephanie He, Lynn Loo, Jennifer Rexford, Pulin Sanghvi*
- Task Force on Curricular and Cocurricular Programs: *Christopher Kuenne (Cochair), Melissa Lane (Cochair), Kimberly de los Santos, Jonathan Levy, Derek Lidow, Pascale Poussart, Rabbi Julie Roth, Daniel Rubenstein, Jeffrey Stout*
- Task Force on Incubator Space: *David MacMillan (Chair), Lynda Clarizio, Cornelia Huellstrunk, Paul LaMarche, Adel Mahmoud*
- Task Force on Entrepreneurship Funds: *Gordon Ritter (Chair), John Diekman, Cornelia Huellstrunk, John Ritter*
- Task Force on Branding and Policy: *Kai Li (Chair), Catherine Dennig, Eric First, Sanjeev Kulkarni, JP Singh*

### **Committee Process**

- *Self-study phase*: January–July 2014 (and continued throughout the rest of 2014)
  - About 350 individual conversations at Princeton so far
  - About 250 more online comments on PEAC website since May 16
  - About 100 individual conversations with faculty, staff, and students at about 10 peer institutions
- *Interim update*: July 2014
- *Recommendation phase*: July–December 2014
- *Internal discussion of recommendations*: December 2014
- *PEAC Report*: March 2015

**Acknowledgement:** The committee is grateful to the diverse set of input provided by hundreds of students, faculty, staff, alumni and community members, discussion with faculty, staff and students at peer institutions, support from the Provost’s office and the President’s office, and the effort by everyone on the Task Forces.