Experiential entrepreneurship programs at universities:

Are they all the same?

Toward a framework for understanding[1]

WORKING PAPER
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Introduction

Entrepreneurship education is important. The development of entrepreneurial skills is a valuable complement to almost any education: undergraduate liberal arts, engineering at any level, business, medicine, and many other fields. Many believe that training in entrepreneurship stimulates powers of observation, develops creative and critical thinking, and instills an orientation to disciplined and collaborative action. An entrepreneurial mindset and skillset are believed to enable an individual to be a more effective contributor in very many careers and pursuits. So entrepreneurship is being embraced by a large and growing number of educational institutions.

Entrepreneurship, however, is an immature discipline. The ratio of strongly held opinion to evidence is high. Rhetoric and marketing still trump science. Anyone who has been involved in one startup and is sufficiently bold can claim to have been initiated into the mysteries and offer expert advice.

This study is part of a broad initiative to inject discipline into entrepreneurship education. Can entrepreneurship be taught? What are the right approaches to entrepreneurship education. The participants in this research project believe these questions deserve careful study. As a first step to addressing these questions, we have selected seven specific entrepreneurship programs from seven universities for examination. All of the participating universities have multiple entrepreneurship programs. Specific programs were selected to create a comparison set with wide variation. These seven programs are very different from each other.

We envision a research program that builds a solid foundation in a framework and vocabulary for describing and comparing programs. In this study, we will lay a foundation for analyzing and comparing university entrepreneurship programs of a specific kind. Entrepreneurship education, as is true of many business disciplines, falls roughly into three categories. The first category is what we might call *theory-driven* education. The approach is to communicate concepts and principles through lecture and textbooks or other readings. A second approach is *case-based*, reflecting the pedagogy of many business schools. Here, case studies are used to illustrate key concepts and principles. On this pedagogy, students are guided to infer the relevant ideas from the examples. A third form of pedagogy is *experiential* or *learning-by-doing*. Students are immersed in the activity itself and are guided with a view both to the successful advancement of their project and to an understanding of the principles underlying successful practice.

This study concerns experiential entrepreneurship programs specifically. That is, the programs considered here have learning-by-doing as the principal or core form of learning, although this pedagogy may of course be supplemented by other forms of teaching. This paper lays out a framework for comparing experiential entrepreneurship programs. This framework has a set of dimensions and a vocabulary to describe the salient features of all these programs. The purpose of this framework is to describe and compare, not to evaluate (see Figure 1). We offer this paper and framework as the start of a foundation for research into the effectiveness of various approaches in different contexts. [2]

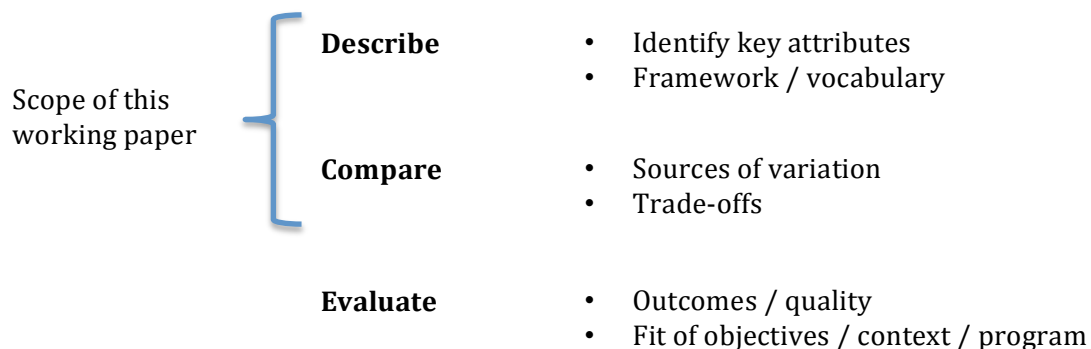**Process of research into entrepreneurship education**

Figure 1

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[2] With a view to the short-term practical utility of this objective, many of the key points and concepts are laid out in such a way that they may be adapted to a questionnaire format as an aid to analyzing and possibly designing programs.

All the programs discussed here have similarities. They are all team-based and use some part of the process of new venture creation as the vehicle of instruction. All of these programs include a mix of curricular and co-curricular elements. That is, course work is integral to the programs, but there are additional activities beyond the courses.

An important objective of this study is to understand how entrepreneurship programs differ and how they differ. Are there material differences between programs and, if so, in what areas? Can we find difference of opinion among the architects of these programs and can we expose and clarify the points at issue? Or is it the case that all programs share the same basic structure and are based on the same fundamental understanding of the phenomena and so programs only differ in terminology or other superficial features. It is this author's opinion that the programs differ in substance and that these differences (the variation among programs) are driven primarily by three factors: 1) target (students and projects), 2) objectives, and 3) the underlying theory of entrepreneurship. However, this opinion is highly provisional and much more study is required.[3]

Drivers of variation among programs

1. **Target:** Who is the target audience for the program (level of student / composition of teams)? In particular, is the target the few students most committed to entrepreneurship or a broader cross-section of students?
2. **Objective:** What is the mix of objectives between pedagogy and success of the ventures?
3. **Theory of entrepreneurship:** Is there an underlying theory of entrepreneurship? How structured or rigorous is it? There are two dimensions of such theories.   • **Structured frameworks**: ways to organize ideas and activities   • **Approaches to sequencing of activities**: the logic of the order or sequence of activities

Figure 2

Overview of the programs

This section contains summaries of the seven programs. A fuller description of each program can be found in the appendix.

1. **The eSeed Challenge, Arizona State University**, **the Fulton Schools of Engineering**: The eSeed Challenge is part of ASU's Innovation Challenge program, a series of competitions that are defined and led by the University's colleges and schools. The ASU Innovation Challenges engage students in the New American University design aspiration of valuing entrepreneurship and providing entrepreneurial experiences to all ASU students. The Fulton Schools of Engineering eSeed Challenge enables students to win up to $6,000 in seed funding and an all-expense paid innovation field trip to advance their entrepreneurial venture.

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[3] Two possibly important factors that may result in variation among programs not considered in this study but that may be included in future work are: resources and impact on programming of level of resource and interpretations of "experiential learning."

2. **Edward L. Kaplan, '71, New Venture Challenge (Traditional Track), University of Chicago Booth School of Business**: Launched in 1996, the Edward L. Kaplan, '71, New Venture Challenge (NVC) program run by the Polsky Center for Entrepreneurship and Innovation at the University of Chicago is a year-long, intensive business launch program that begins in the Fall academic quarter with events and resources aimed at supporting idea generation, customer discovery, idea validation, and team formation. Teams receive additional resources and support heading into the Winter quarter. They must apply to the NVC in early February. Only teams whose proposals show significant promise are selected to advance into Phase II of the program – a Spring quarter academic class. In this class, teams receive dedicated coaching, feedback and support, access and introductions to a variety of resources and mentors with domain expertise; present their business plans twice to a panel of expert judges; and refine and improve their business plans. At the end of the Spring quarter, the top 10 teams advance to the finals competition which is held in late May/early June. At the NVC Finals, teams present their investor pitch to a panel of judges and compete for $1M+ in prizes and business services.

3. **The Program for Entrepreneurs (P4E), Duke University, the Fuqua School of Business:** The Program for Entrepreneurs (P4E) is an experiential learning program that uses the process of starting a new venture as a vehicle for education. It comprises a three-course sequence housed in the Business School along with supporting resources and activities, including a series of workshops and meetings in preparation for the program focused on team formation and project selection. The duration of the program is nominally 18 – 24 months.

4. **Technological Innovation: Generating Economic Results (TI:GER®), Georgia Institute of Technology, The Scheller College of Business**: The TI:GER program is a multidisciplinary, experiential learning program focused on technology entrepreneurship. The program teams PhD students in science and engineering with MBA and JD students to examine issues surrounding the potential for commercialization of the PhD student thesis research. Students take the three course TI:GER sequence while continuing to pursue their degrees. Each team has a legal and a business mentor, and is given multiple opportunities to interact with industry advisors and the greater entrepreneurial community. The program is a 12 credit hour program, 9 credits of which can be used as a minor for the PhD students in the program.

5. **delta v accelerator, MIT:** MIT delta v is an educational accelerator for MIT student entrepreneurs to help them accelerate their growth in building viable, sustainable ventures. The program is a capstone educational opportunity for MIT entrepreneurs before they launch into the real world. Delta v takes the best teams with an interesting idea or proof of concept and focuses on creating impactful, innovation-driven startups. For 2016, 17 teams spent their summer months working full-time at the Martin Trust Center with an emphasis towards: team building / organization development and dynamics, understanding their target market, customers, and users, learning the mechanics of venture creation (company formation, legal, financial, raising money and more).

6. **Launchpad, D-School, Stanford University**: Launchpad is a d.school class at Stanford for entrepreneurs. The teaching philosophy is built around the

culture of start-ups and what makes them tick. In the class Stanford students take an idea for a product or service and start a company in 10 weeks. The emphasis is on the entrepreneur, not the idea. The focus is on doing, not planning. It is totally different than other incubators or accelerators. Since the annual class started in 2009, 90 companies have launched and over 50 are still in business.

7. **Creative Destruction Lab, University of Toronto, Rotman School of Management**: The foundation for the Creative Destruction Lab Course (CDL) is the CDL high tech incubator. The course is a hands-on learning experience where students are matched to real, science-based ventures in the program. The MBAs do not form their own ventures; rather, they provide a supporting role and help others achieve their objectives. This course is taken during the second year of the MBA program and runs from September-April. Recently, a handful of commerce undergraduates have been accepted to take the class.

Overview of the framework

Creating a framework to describe and compare programs requires identifying the key features of entrepreneurship programs. Naturally, many details and nuances will be omitted. But this project should be judged ultimately by two criteria:

- Are all of the important features for comparing programs included? In other words, can all important differences between programs be identified using the framework?
- Can the framework serve as a guide to designing a new program? Are all the important program design decisions represented?

There are five basic dimensions of our framework: objectives, selection, entrepreneurial process, pedagogy, and access to resources. Despite being a simplification, we intend this framework to capture the main features and differences of the programs considered.

Objectives:

The objectives of these various programs are a combination of pedagogy and new venture creation/development. That is, the result the programs are trying to achieve will either be learning by students or the creation or furthering of a new venture or both.

Selection

There are two main concepts that we include under selection: what students and what projects are the targets of the program and how selective is the program, that is, how strenuous is the admission process. To the first question, we note that programs may focus on students at various levels in their education or focus on students from different disciplines. And they may be more or less inclusive and more or less interdisciplinary.

Pedagogy

This dimension contains the familiar questions of who teaches the material, how is it taught, what are the course readings and deliverables. Most interesting for the comparison may be the subject matter of the teaching. We classify the subject matter under four headings:

- Entrepreneurship principles
- Functional areas in business (marketing, finance, etc.)

- Specific knowledge of relevant technical disciplines (areas of science, engineering, etc.)
- Character or mindset oriented material

Entrepreneurial process

This is an area of considerable difference among programs. The central idea is whether the program attempts to spell out an entrepreneurial process. Such a process involves, possibly, both frameworks for organizing information and choices (the *Business Model Canvas* is a popular example) and some form of decision process for determining an order of execution. At one end of the spectrum, programs rely on experienced entrepreneurs and investors to provide *ad hoc* advice. Other programs have, in varying degrees. more formal and documented processes that they expect entrepreneurial teams to follow.

Access to resources

Programs may provide access to various kinds of resources needed by entrepreneurs. First and most obvious is access to capital through associated investors. In addition, programs may provide laboratory and technical resources for testing, prototyping, etc. Healthcare related startups usually require regulatory expertise and programs may have provided for this. Finally, at some point all new ventures require access to legal resources — primarily corporate law but often also intellectual property law.

Comparison template

Objectives		
	New venture creation/advancement	Primary or secondary
	Pedagogy	Primary or secondary
Selection		
	What	Teams, students, projects
	Target students	School / level
	Degree of interdisciplinarity of teams	Required, encouraged, or not. What disciplines included
	Project stage at entry	Nucleation / early pre-company / early company pre-revenue / early revenue / scaling
	Project: industry/market	Tech / med device / consumer / …
	Selectivity — students	Degree of selectivity / application process: This could be measured by the number of applications and the percentage accepted
	Selectivity — projects	Degree of selectivity / application process (measured as above)
Pedagogy		
	Courses / duration	How many courses over what period of time
	Instructors	Research faculty, practitioner faculty, non-faculty practitioners: how organized, %time
	Mentors	Number and kinds of mentors
	Learning outcomes	Entrepreneurial principles / functional disciplines / specific technical knowledge / character or mindset. Does the program have a list of the things an entrepreneurial student should know?
	Functional disciplines covered	Strategy, marketing, finance …
	Course materials / readings	Required material
	Deliverables	Reports, presentations …
	Who judges or evaluates	Faculty, investors …
	Tracks	By market / industry / technology …
Entrepreneurial process		
	Degree of structure	High / low / none
	Documentation	Reference
	Frameworks applied (evaluation & planning)	Five forces / VRIN / business model canvas / …
	Decision process / sequence	E.g., lean experiments — some description of the steps to be taken
Access to resources		
	Capital	Competitions / access to angel or other investors
	Affiliated competition	Yes / no; amount
	Testing	Lab facilities and equipment available
	Prototyping	Facilities to build mock-ups or function prototypes
	Regulatory	Access to regulatory expertise
	Legal	Legal clinics / IP advice / …

Program descriptions

1. The eSeed Challenge, Arizona State University

Objectives		
	New venture creation/advancement	Primary
	Pedagogy	Secondary
Selection		
	What	Projects (students evaluated as part of projects)
	Target students	All students
	Degree of interdisciplinarity of teams	Preferred
	Project stage at entry	Pre $5K in funding or revenue
	Project: industry/market	All
	Selectivity — students	Selection is project based, students included in project
	Selectivity — projects	Moderate to high
Pedagogy		
	Courses / duration	1 year / single 1 credit course
	Instructors	Research faculty, non-faculty practitioners
	Mentors	Yes
	Learning outcomes	Entrepreneurial experience / career development
	Functional disciplines covered	Marketing / strategy / finance / operations
	Course materials / readings	None
	Deliverables	Pitch decks
	Who judges or evaluates	Non-academic judges
	Tracks	Ed-tech, Energy/Clean-tech, Cybersecurity, F&B/Hospitality, Hardware, IOT/ Wearable, Media/ Entertainment, Retail/ Lifestyle, Social/ Non-profit, Med-tech, Software/IT/e-com
Entrepreneurial process		
	Degree of structure	Low
	Documentation	No
	Frameworks applied (evaluation & planning)	"Evidence-based" template
	Decision process / sequence	No
Access to resources		
	Capital	Yes
	Affiliated competition	Program is primarily a competition, $6K prize
	Testing	Yes
	Prototyping	Yes
	Regulatory	Yes
	Legal	Yes

2. New Venture Challenge, UChicago

Objectives		
	New venture creation/advancement	Primary
	Pedagogy	Primary
Selection		
	What	Projects
	Target students	MBA / graduate, but open to all students
	Degree of interdisciplinarity of teams	Preferred
	Project stage at entry	Early stage companies, usually pre investment
	Project: industry/market	All
	Selectivity — students	Selection is project based, one MBA student required
	Selectivity — projects	High
Pedagogy		
	Courses / duration	1 year / single 1 quarter course
	Instructors	Research faculty, practitioner faculty
	Mentors	Faculty + several business mentors
	Learning outcomes	Entrepreneurial experience and understanding
	Functional disciplines covered	Marketing / strategy / finance / communication
	Course materials / readings	None beyond website material
	Deliverables	Business plan
	Who judges or evaluates	Faculty and panel of non-academic judges
	Tracks	4 tracks — MBA, College, Executive, and Social
Entrepreneurial process		
	Degree of structure	Moderate
	Documentation	http://research.chicagobooth.edu/nvc/traditional-nvc/
	Frameworks applied (evaluation & planning)	UChicago entrepreneurial framework
	Decision process / sequence	High level venture development process
Access to resources		
	Capital	Yes
	Affiliated competition	Program is primarily a competition, $1M total prize money and services
	Testing	Yes
	Prototyping	Yes
	Regulatory	Yes
	Legal	Yes

3. The Program for Entrepreneurs (P4E), Duke University

Objectives		
	New venture creation/advancement	Secondary
	Pedagogy	Primary
Selection		
	What	Projects and student teams together
	Target students	MBA but open to all students
	Degree of interdisciplinarity of teams	Encouraged but not required
	Project stage at entry	Usually at idea stage, must be pre-investment / pre-revenue
	Project: industry/market	All
	Selectivity — students	Selection is project based with small consideration to students
	Selectivity — projects	Very low threshold — teams rarely not admitted
Pedagogy		
	Courses / duration	1.5 – 2 years / 3 courses plus co-curricular
	Instructors	Practitioner faculty
	Mentors	1 faculty + 1 or more business mentors
	Learning outcomes	Entrepreneurial experience + focus on understanding principles underlying entrepreneurial action
	Functional disciplines covered	Marketing / strategy / finance
	Course materials / readings	None beyond website material
	Deliverables	Reports + pitches; business plan at conclusion of 3rd course
	Who judges or evaluates	Primarily instructors with input from outside advisors
	Tracks	No
Entrepreneurial process		
	Degree of structure	Highly structured
	Documentation	http://www.dukep4e.org/; http://www.dukeven.com/
	Frameworks applied (evaluation & planning)	Duke entrepreneurial framework; some strategy frameworks: VRIN in particular
	Decision process / sequence	Specific attention paid to the order or sequence of execution and plan development
Access to resources		
	Capital	Introduction to investors including Duke Angel Network if sufficiently advanced
	Affiliated competition	No (Duke Startup Challenge is completely separate)
	Testing	No
	Prototyping	No
	Regulatory	Access to Duke Clinical Research Institute
	Legal	Start-up Law Clinic for corporate issues, very limited IP help

4. TI:GER®, Georgia Institute of Technology

Objectives		
	New venture creation/advancement	Secondary
	Pedagogy	Primary
Selection		
	What	Projects and student teams together
	Target students	Grad Science or Engineering, MBA, JD
	Degree of interdisciplinarity of teams	Required
	Project stage at entry	Promising technology
	Project: industry/market	Science / engineering based ventures
	Selectivity — students	High — stringent application process
	Selectivity — projects	Moderate
Pedagogy		
	Courses / duration	2 years / 3 courses plus co-curricular
	Instructors	Research faculty, non-faculty practitioners
	Mentors	Academic + 1 or more business mentors
	Learning outcomes	Entrepreneurial experience + focus on understanding principles underlying entrepreneurial action
	Functional disciplines covered	Marketing / strategy / finance / legal (IP)
	Course materials / readings	Text cited below
	Deliverables	Specific reports: IP assessment, market assessment, commercialization plan, grant applications
	Who judges or evaluates	Faculty + Advisory Board (outside advisors — legal and investors)
	Tracks	No
Entrepreneurial process		
	Degree of structure	Highly structured
	Documentation	"Technological Innovation: Generating Economic Results" 2nd edition," *Advances in the Study of Entrepreneurship, Innovation, and Economic Growth* Volume 26 edited by Sherry Hoskinson and Marie Thursby, 2016; and other books in the series
	Frameworks applied (evaluation & planning)	GATech entrepreneurial framework; several strategy frameworks: particularly for industry analysis
	Decision process / sequence	High level venture development sequence
Access to resources		
	Capital	Yes
	Affiliated competition	No
	Testing	Yes
	Prototyping	Yes
	Regulatory	Yes
	Legal	Yes

5. delta v accelerator, MIT

Objectives		
	New venture creation/advancement	Secondary
	Pedagogy	Primary — developing entrepreneurial skills
Selection		
	What	Student teams
	Target students	Any
	Degree of interdisciplinarity of teams	Strongly encouraged
	Project stage at entry	Early
	Project: industry/market	Any
	Selectivity — students	High — selection is on the team
	Selectivity — projects	Low — "People first, projects second"
Pedagogy		
	Courses / duration	90 day summer program — capstone entrepreneurship experience at MIT but not a course
	Instructors	Practitioner faculty, EIRs
	Mentors	Many, specialists as necessary
	Learning outcomes	Entrepreneurial skills
	Functional disciplines covered	Company formation, legal, financials, fund raising, sales, marketing, etc.
	Course materials / readings	*Disciplined Entrepreneurship* (Aulet), *Entrepreneurial Strategy* (Stern and Gans), *Founder's Dilemma* (Wasserman)
	Deliverables	Monthly milestones presented and graded at board meetings
	Who judges or evaluates	Instructors acting as a "board"
	Tracks	None
Entrepreneurial process		
	Degree of structure	Structured
	Documentation	*Disciplined Entrepreneurship*
	Frameworks applied (evaluation & planning)	Design Thinking, experimentation, "crossing the chasm"
	Decision process / sequence	"24 steps" in *Disciplined Entrepreneurship*
Access to resources		
	Capital	Grants during program then introduction to investors at "Demo Day"
	Affiliated competition	None
	Testing	Yes
	Prototyping	Yes
	Regulatory	Yes
	Legal	Yes

6. Launchpad , Stanford

Objectives		
	New venture creation/advancement	Primary
	Pedagogy	Secondary (but primary in the sense of producing founders)
Selection		
	What	Students actively taking steps to start a company
	Target students	Any student team that wants to start a company
	Degree of interdisciplinarity of teams	Open but actively recruit for diversity in the cohort of teams
	Project stage at entry	Early — idea stage
	Project: industry/market	Any
	Selectivity — students	High — screening for commitment and serious intent
	Selectivity — projects	Low
Pedagogy		
	Courses / duration	1 10 week course with follow-on advising
	Instructors	Practitioner faculty
	Mentors	Many (entrepreneurs and investors)
	Learning outcomes	Committed entrepreneurs
	Functional disciplines covered	Rapid prototyping / market testing, pricing, entrepreneurial finance, hiring / team building, leadership
	Course materials / readings	None
	Deliverables	^15 assignments over 20 class sessions
	Who judges or evaluates	Instructors
	Tracks	None
Entrepreneurial process		
	Degree of structure	Highly structured
	Documentation	*Launchpad: A Founder's Guide to Starting a Company* (Klebahn & Utley), Various articles on specific topics
	Frameworks applied (evaluation & planning)	Dolan Pricing Thermometer, Visual Design for Founders
	Decision process / sequence	^ 15 "missions" in *Launchpad*
Access to resources		
	Capital	Introductions to VCs
	Affiliated competition	None
	Testing	None
	Prototyping	None
	Regulatory	None
	Legal	None

7. Creative Destruction Lab, University of Toronto

Objectives		
	New venture creation/advancement	Primary
	Pedagogy	Secondary
Selection		
	What	Projects (companies) and students separately
	Target students	MBA
	Degree of interdisciplinarity of teams	NA
	Project stage at entry	Early stage companies
	Project: industry/market	All
	Selectivity — students	Highly selective (separate from project/company selection)
	Selectivity — projects	Highly selective
Pedagogy		
	Courses / duration	1 year / 1 course
	Instructors	Academic
	Mentors	Business mentors advise companies (CDL incubator), research faculty direct students
	Learning outcomes	Entrepreneurial understanding through immersion in the process
	Functional disciplines covered	Marketing / strategy / finance
	Course materials / readings	Gans Entrepreneurial Strategy course for students, not companies
	Deliverables	Students produce reports to help companies
	Who judges or evaluates	Community entrepreneurs and investors ("Group of Seven")
	Tracks	Open track & machine learning track
Entrepreneurial process		
	Degree of structure	None — *ad hoc* advice: judgment of experienced entrepreneurs and investors
	Documentation	NA
	Frameworks applied (evaluation & planning)	None
	Decision process / sequence	None
Access to resources		
	Capital	Introduction to investors
	Affiliated competition	No
	Testing	No
	Prototyping	No
	Regulatory	No
	Legal	Yes

Program comparisons

This section contains a few broad comparisons between these small number of programs and also spells out in greater detail templates for comparing programs in the two areas of pedagogy and entrepreneurial process.

Objective

Programs differ significantly on their objectives. Although they all involve both pedagogic and commercialization objectives, they differ on the relative emphasis on these objectives. Figure 3 depicts where the programs stand.
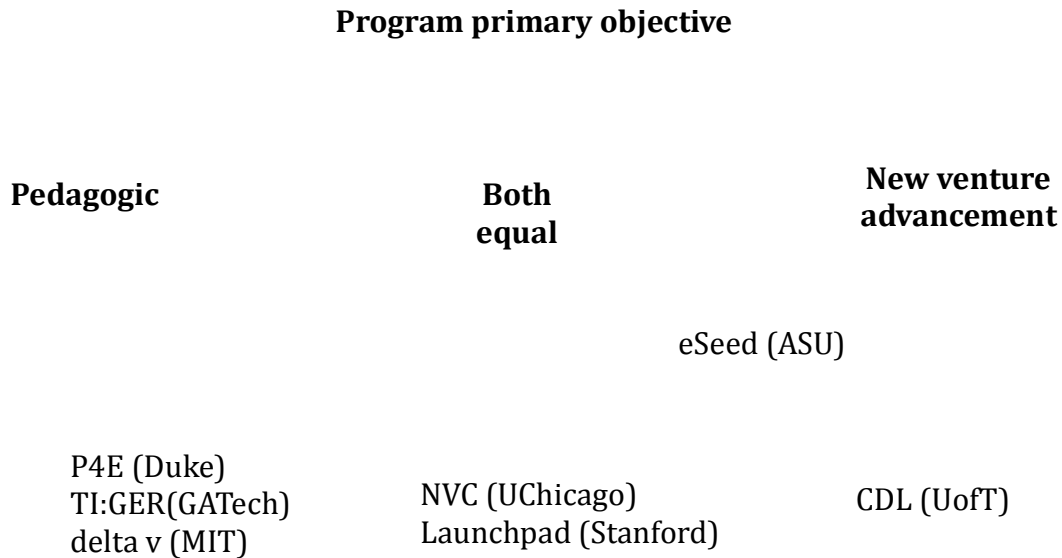
Program primary objective

Pedagogic	Both equal	New venture advancement
	eSeed (ASU)	
P4E (Duke) TI:GER(GATech) delta v (MIT)	NVC (UChicago) Launchpad (Stanford)	CDL (UofT)

Figure 3

As seems somewhat natural, the programs who see their primary purpose as pedagogic have less stringent admissions requirements, focus on earlier stage projects, have a more structured and documented process that they expect student teams to follow, and include more course work. On the other hand, programs that see their role as more to advance actual ventures have more stringent entry requirements, work on more developed ventures, rely on experienced entrepreneurs for direction rather than a formal process, and involve less coursework.

Selection

Programs differ substantially in their selection process, in particular, in their degree of selectivity (ratio of acceptances to applications). The differences are summarized in this table.

Selection

	eSeed Challenge, ASU	New Venture Challenge, UChicago	P4E, Duke	TI:GER, GATech	delta v, MIT	Launchpad, Stanford	CDL, UofT
What	Projects (students evaluated as part of projects)	Projects	Projects and student teams together	Projects and student teams together	Diverse teams of student entrepreneurs	Student entrepreneurs	Projects and students separately
Target students	All students	MBA / graduate, but open to all students	MBA but open to all students	Grad Science or Engineering, MBA, JD	Open to all students	Open to all students	MBA
Degree of interdisciplinarity of teams	Preferred	Preferred	Preferred	Required	Not required but heavily considered in selection	Not required but active recruiting for divers cohort	NA
Project stage at entry	Pre $5K in funding or revenue	Pre investment	Usually at idea stage, pre-investment / pre-revenue	Promising technology	Idea	Idea	Early stage companies
Project: industry/ market	All	All	All	Science / engineering based ventures	All but must be ambitious in impact	All	All
Selectivity — students	Low	Moderate	Low	Moderate	High (team)	High	Highly selective
Selectivity — projects	Moderate to high	Highly selective	Low	Moderate	Moderate	Low	Highly selective

Figure 3

We can summarize (and possibly oversimplify) the differences surrounding selection by differentiating programs that are highly selective from those that are intended to serve a broader base of students. Highly selective programs intend to identify the few most committed and capable student entrepreneurs. They guide and push these students to advance their entrepreneurial endeavors. More broad-based programs, on the other hand, attempt to develop an entrepreneurial skillset in a more average student population. We summarize the programs considered here in this table.

	High selectivity (focus on committed student entrepreneurs)	Low selectivity (address broad set of students)
People	Launchpad (Stanford) delta v (MIT)	P4E (Duke)
Projects	TI:GER (GATech) NVC (UChicago) CDL (U of Toronto)	eSeed (ASU)

Figure 4

Although all programs involve new venture creation, they do not all focus on the same **stage** of this process. Some programs concentrate on the early phase of shaping the core business idea and others select already well formed ideas and focus on growth. To some extent, the objectives of the program will constrain the choice regarding stage. For example, it would be difficult to build a program about growth of entrepreneurial ventures (the early revenue phase) based on student led teams. Also, the choice of stage will have a number of implications for the design of the programs, for example, what material or topics can be covered and who are the best advisors and instructors to involve. So the learning for students will be possibly quite different depending on the stage of venture development that is the focus.

Figure 5 depicts the stage of venture that is the focus on the programs.
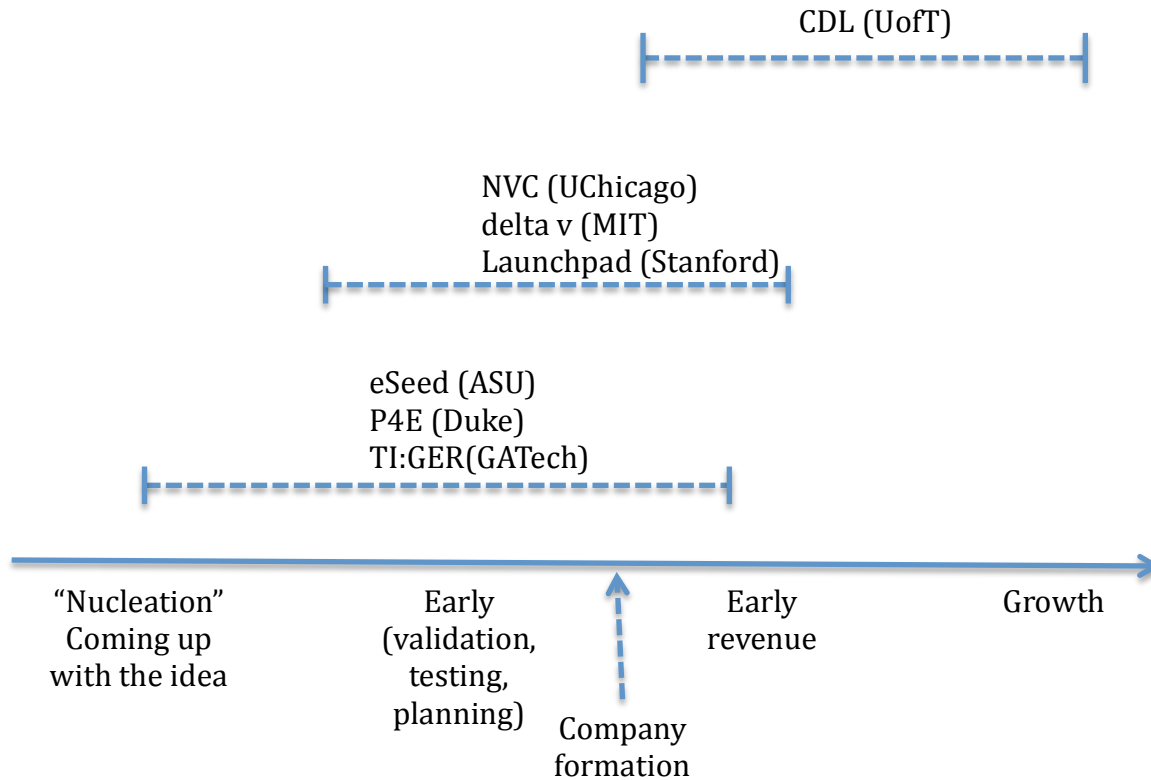
CDL (UofT)

NVC (UChicago)
delta v (MIT)
Launchpad (Stanford)

eSeed (ASU)
P4E (Duke)
TI:GER(GATech)

"Nucleation"
Coming up
with the idea

Early
(validation,
testing,
planning)

Company
formation

Early
revenue

Growth

Figure 5

Pedagogic approaches

We can describe pedagogic approaches by outlining three basic dimensions of teaching.

- Who are the instructors,
- What topics are taught,
- How are they taught.

To address the first question, we note that all of the programs surveyed here involve many people in the pedagogic process. So it is important to distinguish the various roles involved. Numbers are also important as they may indicate bout the intensity of engagement with students and the diversity of viewpoints.

To describe differences among programs, we need both a classification of the kinds of individuals participating and the kinds of roles involved in the delivery of the entrepreneurship program. Obviously both classifications will obscure nuances. First we distinguish five kinds of individuals who play a role in the delivery of entrepreneurship programs.

1. Research entrepreneurship faculty — faculty whose primary role is research in entrepreneurship.
2. Practitioner entrepreneurship faculty — regular faculty whose credentials derive primarily from their business experience. These faculty may differ significantly in the degree of engagement with academic research.

3. Adjunct faculty of entrepreneurship — part-time faculty engaged in the delivery of entrepreneurship programs.
4. Management and investment professionals — individuals who are currently or have recently been involved in the management of or investing in entrepreneurial ventures.
5. University staff involved in the administration of programs or working with and advising students.
6. Subject matter experts in relevant fields but not entrepreneurship. These people may range over a diverse set of topics from regulatory issues, IP law to leadership and team dynamics.

As one can see, entrepreneurship programs may involve the coordinated efforts of a diverse set of people. Similarly, the things to be done, the roles involved in a robust program are also diverse. We summarize the main roles as follows.

1. Design, organization, and oversight of the program.
2. Delivery or communication of specific entrepreneurship material or topics — not project-specific, for example workshops on raising capital or minimum viable product.
3. Delivery or communication of material not specific to entrepreneurship, for example, workshops on design thinking, market intelligence, or medical reimbursement.
4. Advising or mentoring project teams — engaging in issues that the teams are facing.

Armed with these two classifications and calibrating for the size of the programs, we can create a simple representation of who is involved in the delivery of a program for a cohort of students and projects.

We illustrate with a representation of the delivery of Duke's P4E for a cohort of students that begins with about forty students and fifteen projects and ends with twenty students working on four projects (see figure 6). The duration of a pass through the program for one cohort is eighteen months and comprises three courses.

Illustration: Personnel delivering P4E (Duke)

	Design, organization, oversight	Workshops / classes on entrepreneurship material	Workshops / classes on relevant non-entrepreneurship material	Mentoring / advising project teams
Research entrepreneurship faculty				6
Practitioner entrepreneurship faculty	1	1		1
Adjunct entrepreneurship faculty				
Management and investing professionals		10		18
Administrative staff	1			1
Subject matter experts				6

Figure 6

We can perform a similar analysis regarding the questions of what topics are covered and how that material is communicated. We organize the subjects covered in the program according to four broad categories:

- Principles of entrepreneurship
- Functional business disciplines
- Knowledge of technical subjects and relevant environmental factors
- Mindset and emotional preparedness

We also enumerate three methods of handling specific topics. These might be seen as reflecting the emphasis that the program puts on the specific subjects, or the level of depth of coverage. We summarize these approaches.

- There is a comprehensive articulation of the subject matter that students are expected to apply to their projects
- The students are expected to advance their projects relative to the topic and are given guidance as they make progress — in this case, the guidance is tailored to the project
- The students may or may not address the topic and are given *ad hoc* advice as appropriate.

A couple of examples may help to clarify these approaches. At some stage of their development, almost all new ventures will have to create a forecast of future revenue.

Working backward through the three methods outlined above, one approach may be to wait until the time where a revenue forecast is required and then simply to ask a team to begin to estimate revenue, possibly with a couple of general bits of advice. Then an advisor, presumably a mentor who has been working with the team would begin to challenge their assumptions and help them refine their work. On the second approach, every team would be required to create a revenue forecast but the guidelines would be similarly sparse as in the first approach. In the last and most structured method, principles of defining total addressable market, segmenting the market, evaluating adoption rates, etc. would be articulated in advance, and then teams would be asked to complete a forecast.

A second example is creating a capitalization table. This is an exercise that is often not relevant for student led ventures as they often abandon the project before actually incorporating. So one approach would be only to address the issue when it is actually relevant to the project and offer specific advice to the team as they contemplate forming their company. The middle approach would be to require all teams to go through the exercise but with minimal advance guidance. And the most structured approach would be to offer a framework and principles and then guide the students through the application of these principles.

If we are able to enumerate a comprehensive list of the possibly relevant topics to an entrepreneurial team and project, and then describe the approach or method taken, we would have a very detailed description of the subject matter covered by various entrepreneurship programs. This structure will also provide a comprehensive menu of the possible choices as educators contemplate creating or modifying an entrepreneurship program (see figure 7 for an illustration).

Illustration: Topics and pedagogy in P4E (Duke)

Topic area	Pedagogic approach			
	Topic required Comprehensive description in advance	Topic required Advice given as work progresses	Topic not required but addressed as appropriate Advice given	Not covered
Principles of entrepreneurship				
Evaluating an opportunity	✓			
Entrepreneurial strategy	✓			
Team formation / staffing		✓		
Legal – incorporation			✓	
Creating *pro forma* financials		✓		
Financing, raising capital	✓			
Functional business disciplines				
Marketing	✓			
Finance		✓		
Strategy	✓			
Operations			✓	
Accounting			✓	
Technical subjects				
IP law			✓	
Regulatory			✓	
Engineering / engineering management			✓	
Venture capital			✓	
"Soft" skills				
Entrepreneurial leadership			✓	
Self-assessment			✓	
Team building			✓	
Sales / presentation		✓		

Figure 7

Entrepreneurial process and structure

We come now to a possibly not obvious dimension of entrepreneurship programs. The question at issue is whether the programs are based on an explicit *entrepreneurial process* and if so what is it. This question will have very close ties to the questions of pedagogy.

Naturally, if an entrepreneurial process forms the foundation of the program, it will guide many choices of what topics should be covered. Despite this overlap and attendant difficulties of separating the issue of process from pedagogy, we believe that clarity on this subject is vital to comparing entrepreneurship programs. The process, or lack of one, reflects the *theory of entrepreneurship* at the heart of the program.

We begin by observing that an entrepreneurial process should tell us:

- What to do
- When to do it
- How to do it

Answers to these questions, explicitly or implicitly embody a theory of entrepreneurship. They reflect beliefs about the scope of entrepreneurial action and the activities included within entrepreneurship. The theory also includes beliefs about the factors and drivers of success.

We are not contending that there is a grand unified theory of entrepreneurship nor that any program has such a foundation. Rather, programs seem to have assembled or created various theoretical building blocks and to have used them to design parts of the program.

We divide our analysis of these theories into two parts. First is the set of frameworks used to guide analysis and planning. In some cases, frameworks from core disciplines strategy, industrial organization economics, or marketing are brought to bear. But new frameworks have also been created that are focused on entrepreneurship. Frameworks are basically a structured set of questions. They guide the gathering and analysis of information and, in some cases, the choices made. We classify frameworks into three groups: 1) industry and environmental analysis, e.g., Five Forces, 2) firm position and competitiveness, e.g. the VRIN framework from the capabilities literature in strategy, and 3) specifically entrepreneurial frameworks, e.g., the Business Model Canvas. We consider whether programs employ various frameworks or checklists. For example, the frameworks most prominently used in Duke's P4E are as follows:

- Industry and environmental analysis:
  - IP regimes / complementary assets (Teece)
  - Competitor analysis / Christensen's RPV (resources, processes, values)
- Firm analysis:
  - Industry value chain
  - VRIN (valuable, rare, inimitable, nonsubstitutable)
- Entrepreneurial:
  - Opportunity evaluation: five questions
  - Strategy development: four elements

These frameworks are guides to the question of what to do, but they do not address the questions of when or how. Some examples that address the when and how are Bill Aulet's 24 steps of *Disciplined Entrepreneurship* and the concept of *lean experiments*. It is difficult to give guidelines that are general so these guides are often tailored to a specific domain, for example, tech startups. As far as describing entrepreneurship programs, the question is

whether the program involves prescriptions regarding when and how and, if so, what are these prescriptions and how are they documented.

The topic of entrepreneurial process is complex. The graphic below summarizes in broad terms how the programs differ and so obscures many nuances.

	Structured entrepreneurship process, primary instruction and direction provided by research or practitioner faculty	**Targeted advice without adherence to a process, primary instruction and direction provided by practitioners**
Target —people	P4E (Duke) TI:GER (GATech) delta v (MIT) Launchpad (Stanford)	
Target —projects	eSeed (ASU) NVC (UChicago)	CDL (U of Toronto)

Figure 8

Access to resources

Programs differ substantially on the resources available to participating teams. To a large extent, these differences reflect differences of maturity, financial support, and orientation of the programs. The differences are summarized in this table.

Access to resources

	eSeed Challenge, ASU	New Venture Challenge, UChicago	P4E, Duke	TI:GER, GATech	delta v, MIT	Launchpad, Stanford	CDL, UofT
Capital	Yes	Yes	Limited, Duke Angel Network	Yes	Introduction to investors at Demo Day	Introduction to investors	Introduction to investors
Affiliated competition	Program is primarily a competition $6K prize	Program is primarily a competition, $1M total prizes	No (Duke Startup Challenge completely separate)	No?	$2K grant per student, up to $20K during program	No	No
Testing	Yes	Yes	No	Yes	Yes	Yes	No
Prototyping	Yes	Yes	No	Yes	Yes	Yes	No
Regulatory	Yes	Yes	Access to Duke Clinical Research Institute	Yes	Yes	No	No
Legal	Yes	Yes	Yes, limited IP help	Yes	Yes	Yes	No

Figure 9

Summary

At the outset, we suggested that the specifics of programs and the differences between them would be driven primarily by three factors: objectives, target (students and projects), and the underlying theory of entrepreneurship. The objectives of all programs are a combination of pedagogy and new venture development. How these objectives are blended, or reconciled, differs. To the degree that new venture development is emphasized, care is taken to ensure that entrepreneurial teams receive the best advice. And this usually implies putting experienced entrepreneurs in the role of principal advisors. This approach brings with it less formal structure, less theory, and minimal connection to academic research. To the degree that pedagogy is emphasized, there is more structure, more theory, and a greater connection to academic research. These observations perhaps reflect that university faculty, who are ultimately responsible for these programs, are more comfortable with teaching and general principles than they are giving specific advice to businesses. Correspondingly, these faculty may believe that practitioners who have excellent judgment in particular situations are not well qualified to articulate general principles and to develop well structured curriculum.

In addition, programs are generally designed to meet the needs of their target. Students may be at different levels and in different fields. Teams may also be more or less diverse. So the knowledge and expertise that can be presumed differs widely. Furthermore, projects may be more or less advanced and cohorts of projects may be diverse or concentrated in particular industries or technical fields. All of these considerations will influence material covered, styles of pedagogy, and overall approach to entrepreneurship.

Finally, there is the underlying theory of entrepreneurship. One perspective is that entrepreneurial action does not involve a theory of entrepreneurship. Rather, there is judgment formed though experience, possibly combined with innate intuition. Other points of view will subsume aspects of entrepreneurial action under general principles, although there are no settled opinions about principles or those aspects of entrepreneurship that may be explained by theory. Notwithstanding great differences of opinion, explicit and implicit, beliefs about these issues play an important role in shaping entrepreneurship programs.

Appendix: Program descriptions

Faculty: Dr. Brent Sebold + Dr. Scott Shrake

Institution: Arizona State University

Program name: Fulton Schools of Engineering **-** Generator Labs - eSeed Challenge + Accelerator Program (http://links.asu.edu/eSeed)

Brief description:
The eSeed Challenge is part of ASU's Innovation Challenge program, a series of competitions that are defined and led by the University's colleges and schools. The ASU Innovation Challenges engage students in the New American University design aspiration of valuing entrepreneurship and providing entrepreneurial experiences to all ASU students.
The Fulton Schools of Engineering eSeed Challenge enables students to win up to $6,000 in seed funding and an all-expenses paid innovation field trip to advance their entrepreneurial venture.

Objectives:
The eSeed Challenge is open to all Arizona State University student entrepreneurs who aim to prove or disprove that there is valid demand for a prototyped product or service beyond an initial beneficiary or customer. Organized by the Startup Center within the Generator Labs at Fulton Schools of Engineering, this "top of the funnel" competition aims to strategically develop early-stage student ventures that may be well suited to compete for and win other ASU, local, national, and global entrepreneurship competitions. The eSeed Challenge also helps all supported ventures to develop repeatable and scalable business models, regardless of follow-on funding or support opportunities.

Selection
Projects: All sorts of projects are acceptable: for profit or not-for-profit, and industry or market. However, the idea must be concrete enough that a fairly clear hypothesis can be articulated regarding market need and solution. All projects are at the very earliest stages of development.

Teams:
- All full- or part-time students at Arizona State University may apply/participate.
- Individual students or teams are eligible. Multidisciplinary teams are preferred.
- The team leader must be a full-time or part-time undergraduate or graduate degree-seeking student in the Ira A. Fulton Schools of Engineering during the program period. Finalist applicants will be asked to provide proof of enrollment and winners must be in good academic and disciplinary standing at the time awards are presented.

- Although teams should seek advice from mentors, the project must be student-led.
- Projects, prototypes, ventures or partnerships that have already received more than $5,000 in revenue or grants/awards/investments are not eligible for funds.
- As mentioned, applicants are encouraged to incorporate members and/or mentors from different departments or colleges within the university. Teams may also have members who are not affiliated with the university (e.g., friends, family, work colleagues, etc. who are not ASU students).

Screening:
For the first phase of the eSeed Challenge, an expert panel of community members and ASU affiliates evaluate the following application question responses. (Applicant instructions: The following five question clusters should be addressed in 300 words per question via the online submission form).
1. What is the problem you aim to solve? How did you identify this problem?
2. What is your novel solution? Describe how it solves the problem in three steps. If you have an online demo, what's the URL?
3. Who has the problem and wants your solution bad enough to pay for it? In other words, who is your first customer? This applies to non-profit ventures as well. In many cases, the person or organization who uses the solution may not be the same as those who pay for it. Describe these key individuals or organizations.
4. How will you spend $1,000 in order to get your first pre-orders, crowd funding contributions, or sales? In other words, list specific actions you will take, or experiments you will run, to prove or disprove that there is valid demand for your prototyped solution beyond your initial user and/or payer.
5. List your team members' names, email addresses and phone numbers, along with their majors, their unique ninja skills, and why they are so passionate about solving this problem. How did you all meet?

Each response is evaluated quantitatively. Qualitative feedback may also be provided in responses to accumulative answers. Teams that receive the highest scores will be advanced as eSeed Challenge teams. eSeed Accelerator ventures and prescott Fellow founders are selected by judging panels via affiliated Demo Day events.

Process:
The eSeed Challenge features three highly competitive phases. In Phase One, 30 challenge teams were selected from entries across ASU and given $1,000 to validate or reject their key business model hypotheses. In Phase Two, the challenge teams presented the status of their ventures and competed for admission into the eSeed Accelerator where 10 of the 30 teams were awarded an additional $5,000 to increase traction within their target markets. Finally, in Phase Three, 12 of the eSeed Accelerator team founders will be selected to participate in an all-expenses paid innovation retreat, hosted by Mr. Tom Prescott, the eSeed Challenge's lead benefactor.

Pedagogy:

Instructors: The primary instructor is a Lecturer (administrative faculty) who also serves as the director of the Startup Center within the Generator Labs at Fulton Schools of Engineering. The supporting instructors are Academic Associates (Venture Mentors)who are community-based serial entrepreneurs, retired entrepreneurs, intrapreneurs, etc.

Courses: The academic core of the program is FSE 494/594 - Venture Devils, a one credit hour online course that is repeatable for credit.

Course deliverables: the eSeed program and the affiliated FSE 494/594 - Venture Devils course has been designed to enable student teams to present a minimum of three evidence-based pitch deck iterations approximately once every two weeks throughout the rolling program period(s)--every 7.5 weeks. We believe that this iterative teaching/mentoring structure is innovative for two main reasons. First, we employ the use of an "evidence-based" pitch deck mentoring template. Unlike the Business Model Canvas as a mentoring tool, the evidence-based pitch deck allows for more individual creativity, is often more engaging for all program participants, and aligns better with the expectations of typical startup supporters, judges, and investors. And unlike a standard investor pitch deck, the evidence-based pitch deck incorporates the "fact-based" and "data-driven" proof that is now required to ensure transparency, authenticity, and traction for today's student innovators. Second, after several years of preparing our student teams for local, national, and international startup competitions, we have found that a minimum of three iterative presentation and feedback loops are required for each team to be best prepared for any follow-on support opportunities.

Program and course learning objectives dictate that upon completion, students should:
- Understand the strategic decision-making process associated with starting a new venture.
- Develop professional skills and habits for working with mentors, partners, and other key members of their network.
- Learn tactics for navigating the vetting and launching of a new business in areas including but not limited to customer acquisition, financial forecasting, pitching, securing suppliers, and early-stage growth.
- The overarching goal of the venture/mentor meetings during Phase 1 of the program is to identify the best eSeed ventures and prepare them to deliver a highly effective five-minute evidence-based pitch to a panel of judges who will grant the 10 best ventures an additional $5K in seed funding.

Mentors: Each team is assigned one Venture Mentor (VM). VMs are non-academics (e.g., serial entrepreneurs, retired entrepreneurs, intrapreneurs, etc.) who are hired as Academic Associates and are compensated ($2K) to teach the equivalent of a 1 credit hour course each 15 week term. The goal is that the VMs have both the ability to advise on general business issues and also have some relevant startup/industry experience. eSeed founders will have

access to the VMs once every two weeks and will be required to meet milestones agreed upon by both their teams and the VM. Students may be removed from the program/course if they fail to take it seriously do not show up for meetings, or behave inappropriately (as deemed by the VMs and program supervisors). VMs will not do the work for students – students must be prepared to work very hard and utilize VMs as mentors and guides. VMs will be available for student venture meetings 3 hours each week and will respond to student requests within 48 hours. VMs may not invest in or join student companies until their role as a VM (or other ASU role) has completed; however, VMs will open doors and make introductions as it makes sense for student startup teams who are prepared.

Instruction: The inaugural cohort of 30 eSeed ventures (approximately 90 students) was assembled into six venture clusters, comprising five industry-related teams each. In turn, each cluster was matched with one VM, relative to his/her industry expertise. This "5:1 venture to mentor ratio" recognizes that early stage venture mentors and advisors must be empowered to provide personalized education to the supported entrepreneurs who are pragmatically aligned with their "Socratic circles[4]" of influence.

Access to resources: Through the contacts of the Startup Center within the Generator Labs at Fulton Schools of Engineering, student teams have access to a wide variety of resources, but access is not guaranteed. These resources include, but are not limited to:
- **Investors:** many investors are part of the network. Introductions are usually provided for student teams to get feedback. This occasionally but not often results in an investment.
- **Lab resources:** teams working on engineering or science based projects often need access to lab equipment or prototyping facilities via the Fulton Technology Innovation Lab.
- **Software/Hardware engineering:** Many teams need access to programming and manufacturing talent to move their projects ahead. These resources may be activated via discipline-specific capstone courses/teams, as well as iProject referrals.
- Prototyping/Fabrication: On campus workshops, maker spaces, and fabrication facilities are available to eSeed ventures. Students may also leverage TechShop Chandler for additional tools and resources.
- **Legal:** At ASU there is a complementary legal clinic to get guidance on early legal issues, as well as IP counsel.
- **Industry and Service Provider Experts:** ASU provides office hours for visiting experts in the realms of startup-stage finance and accounting, PR and marketing, business development, ed-tech, med-tech, etc.

Tracks: The eSeed meta-cohort of 30+ ventures are organized into sub-cohorts and categorized to align with one of the following industry verticals:

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[4] http://www.davidgcohen.com/2011/08/28/the-mentor-manifesto/

- Ed-tech
- Energy/Clean-tech
- Cybersecurity
- F&B/Hospitality
- Hardware
- IOT/ Wearable
- Media/ Entertainment
- Retail/ Lifestyle
- Social/ Non-profit
- Med-tech
- Software/IT/e-com

Institution: University of Chicago Booth School of Business

Program name: Edward L. Kaplan, '71, New Venture Challenge – Traditional Track

Brief description: Launched in 1996, the Edward L. Kaplan, '71, New Venture Challenge (NVC) program run by the Polsky Center for Entrepreneurship and Innovation at the University of Chicago is recognized as the top-ranked university accelerator program in the nation. It is a year-long, intensive business launch program that begins in the Fall academic quarter with events and resources aimed at supporting idea generation, customer discovery, idea validation, and team formation. Teams receive additional resources and support heading into the Winter quarter. They must apply to the NVC in early February. Only teams whose proposals show significant promise are selected to advance into Phase II of the program – a Spring quarter academic class. In this class, teams receive dedicated coaching, feedback and support; receive access and introductions to a variety of resources and mentors with domain expertise; present their business plans twice to a panel of expert judges; and refine and improve their business plans, At the end of the Spring quarter, the top 10 teams advance to the finals competition which is held in late May/early June. At the NVC Finals, teams present their investor pitch to a panel of judges and compete for $1M+ in prizes and business services.

Objectives:
Both to teach students what it takes to build a high-potential new venture and to create, encourage and improve high-potential new ventures.

Selection:
Projects: The new venture idea should be original and have commercial promise. The entry may be developed in conjunction with a course or research project, and students may enlist faculty aid. Business plans that have participated in the past as part of other university business plan competitions are not eligible unless approved by one of the NVC faculty or coaches. Business plans for existing early ventures are acceptable if the company has not already received funding from venture capitalists and/or other investors. Teams that have secured arrangements for capital from any source must disclose the amounts and sources in their Phase I executive summaries. Entries that have received outside investment from venture capital firms, private investors, or other industry sources may be considered ineligible to compete.

Teams: There is no minimum or maximum team size. However, each team is required to have at least one currently registered graduate student from the University of Chicago as an active member of the team. The student should be an integral part of the team. This is generally evidenced by an equity stake of at least 10% in the company. Teams comprised of undergraduate students are eligible if: (1) The team has previously participated in the College NVC, or (2) The team includes at least one current graduate student. Teams are strongly encouraged to include at least one student from the University of Chicago Booth School of Business (Chicago Booth) on their team. All registered University of Chicago undergraduate and graduate students, from any department, are eligible to fill out the rest of the team. In addition, teams may have members who are not affiliated with the University of Chicago. Teams are encouraged to identify individuals, within and external to the University, who can contribute additional expertise and experience to help the team succeed.

Screening: To qualify, the University of Chicago student must submit an application before the Phase I deadline (usually in early February) consisting of a Feasibility Summary. This Summary should comprise no more than eight (8) typed and double-spaced pages. It should include:
- A description of the business opportunity and market need, the product or service idea (plus brief technology assessment, if applicable), preliminary analysis of the target market, and potential market size.
- A brief competitive analysis.
- A brief outline of key strategies and objectives.
- A review of the management team and outside advisors (if applicable).

A panel of judges reviews and scores each application. Only the teams whose proposals show significant promise will be selected as semi-finalists and asked to continue to Phase II of the program.

Process:
The NVC follows a year-long program that follows a highly-structured process.

Stages:
- Phase I: Idea Generation, Business Idea Validation & Team Formation
- Phase II: Selection
- Phase III: Course - Mentoring, Critical Feedback & Business Plan Development
- Phase IV: Finals Competition

Functional: Through the program, teams are expected to identify a market need, create a minimum viable product (MVP) that acts as the solution to that market need, specify competitive issues and outline their solution's competitive advantage, develop a robust business plan, and craft a persuasive investor pitch.

Documentation: http://research.chicagobooth.edu/nvc/traditional-nvc describes the process in detail.

Pedagogy:
Instructors: Primary instructors are the Faculty Director of the Polsky Center (who teaches one class section) and the Executive Director/Senior Advisor of the Polsky Center (who teaches the other section). Two class sections are offered in the Spring quarter. The administrative functions of the program are supported by the Polsky Center staff.

Course: The core of the program is a Spring quarter academic class called *BUS 34104 Special Topics in Entrepreneurship: Developing a New Venture* in which two sections are offered—one during the day and one in the evening. The course is offered at the MBA level, and at least one team member must take the course for credit.

Course deliverables: Each team is expected to create a written business plan and must present their company plan and investor pitch twice to a panel of judges.

Mentors/Coaches: Each team is assigned an academic faculty advisor and at least two business mentors. The goal is for the business mentors have both the ability to advise on general business issues and provide relevant industry experience. Teams also get dedicated support through NVC coaches.

Instruction: The course is an inverted classroom in which there is a mix of instruction about specific topics, workshops conducted by guest speakers, and opportunities for student to present and receive feedback from in-class judges, mentors, and coaches.

Access to resources: Through the contacts and services of the Polsky Center, student teams have access to a wide variety of resources that can assist them during the NVC program:

- **Investors:** Many investors and VCs are part of the greater University of Chicago and Chicago Booth network. Introductions are usually provided for student teams to get feedback. Several judges serve as mentors and judges throughout the NVC program, advising students as needed. At the NVC Finals competition, students pitch their ideas to real-life investors. Currently, Origin Ventures, OCA Ventures, and Pritzker Group Venture Capital contribute to the total NVC prize package for the top winning teams. These three firms, therefore, make investments in the winning NVC teams. Teams also frequently raise capital from investors to whom they have been introduced during the NVC.
- **Lab resources:** Teams working on engineering or science based projects are able to access lab equipment and prototyping support from the Polsky Center's state-of-the-art Fabrication Lab, which is located on 53rd Street. Required training and hands-on workshops are available from this office to support access to these services and equipment.
- **Software engineering:** Many teams need access to programming talent in order to move their projects ahead. The University of Chicago Booth School of Business has a dedicated partnership with the University of Illinois-Urbana Champaign (UIUC) College of Engineering to create collaboration opportunities between University of Chicago and UIUC students. One goal of the partnership is to help match business teams with technical talent.
- **Legal:** The Polsky Center has partnered with the University of Chicago Law School to set up a legal clinic to provide teams support and guidance on legal issues. This Corporate Lab service is exclusively for teams in the NVC program. In addition, the Polsky Center also encompasses the university's technology transfer office, where there is additional expertise in the area of IP, technology licensing, and product commercialization. Teams are able to tap into these services as needed.

Tracks: There are currently four tracks of the New Venture Challenge—Traditional, Social, Global, and College. The Social NVC follows the same eligibility and process as the Traditional track, but includes ventures that aim to have a social impact mission. The Global NVC is a dedicated track for the University of Chicago Booth School of Business Executive MBA students at the Chicago, Hong Kong, and London campuses. The College NVC is exclusively for undergraduate students at the University of Chicago.

Institution: Duke University (the Fuqua School of Business)

Program name: Program for Entrepreneurs

Brief description: The Program for Entrepreneurs (P4E) is an experiential learning program that uses the process of starting a new venture as a vehicle for education. It comprises a three-course sequence housed in the Business School along with supporting resources and activities, including a series of workshops and meetings in preparation for the program focused on team formation and project selection. The duration of the program is nominally 18 – 24 months.

Objectives:

The primary objective of P4E is educational. The goal is to enhance the entrepreneurial skillset of students enrolled in the classes. However, all of the projects are potentially real ventures and at least some students on each team are engaged with a view to starting a venture. New venture creation is sometimes a happy result of the program.

Selection

Projects: All sorts of projects are acceptable: for profit or not-for-profit, and industry or market. However, the idea must be concrete enough that a fairly clear hypothesis can be articulated regarding market need and solution. All projects are at the very earliest stages of development. No companies with funding or revenue are admitted.

Teams: Teams must consist of at least two students, although three or more are preferred. Teams generally contain at least one MBA student although exceptions have been made. It is not yet a formal requirement that the teams demonstrate that they have all of the skills needed to advance their projects. In addition, teams must recruit a business mentor to work with them.

Screening: There is a light screen by the instructor, but permission to participate is rarely withheld. It is expected that teams will screen themselves out at the transition points (breaks between courses) as they realize that their ideas are not viable or not as attractive as they had originally thought.

Process:

P4E follows a fairly structured entrepreneurial process.

Stages:
1. Team formation and preliminary idea selection
2. Validating the opportunity
3. Creating a strategy
4. Creating an operating plan

These stages are the same for all ventures, but there are many differences in interpretation and execution among different kinds of ventures.

Functional: Emphasis is on establishing market need, creating a viable product concept, and establishing sustainable competitive issues. So the functional areas of strategy and marketing in a new venture are always front and center. Issues related to incorporation, financing, and other disciplines are dealt with as needed and somewhat *ad hoc*.

Documentation: www.dukeven.com and www.dukep4e.org describe the process in detail.

Pedagogy:

Instructors: Primary instructor is a Professor of the Practice (practitioner instructor) with significant involvement by a senior member of the staff of the Center for Entrepreneurship and Innovation.

Courses: The core of the program is a three-course sequence reflecting the process described above. The courses are offered at the MBA level, but through cross-listing are available to all students at the university. Non-MBA students currently constitute 10–15% of the students enrolled.

Course deliverables: Each course requires a written report according to a template in which the team documents their main findings and decisions. There is also a presentation, usually to a panel of investors.

Mentors: Each team is assigned an academic faculty advisor and at least one business mentor. The goal is that the business mentors have both the ability to advise on general business issues and also have some relevant industry experience.

Instruction: The courses are a mix of instruction about specific topics, workshops conducted by guest speakers, and opportunities for student to present to each other and give and get feedback. The work of the students is all in their teams trying to advance their project.

Access to resources: Through the contacts of the Center for Entrepreneurship and Innovation, student teams have access to a wide variety of resources, but access is not guaranteed.

- **Investors:** many investors are part of the network. Introductions are usually provided for student teams to get feedback. This occasionally but not often results in an investment.
- **Lab resources:** teams working on engineering or science based projects often need access to lab equipment or prototyping facilities. The program has a very limited ability to help with this.
- **Software engineering:** Many teams need access to programming talent to move their projects ahead. There is not organized way to facilitate this, but student teams can often find the resources they need at the university.
- **Legal:** At Duke there is a complementary legal clinic to get guidance on early legal issues. This guidance is very limited in the area of IP.

Tracks: There are currently no tracks by area of interest (e.g., healthcare, tech, etc.), although this is contemplated for the future.

Institution: Georgia Institute of Technology (The Scheller College of Business)

Program name: Technological Innovation: Generating Economic Results (TI:GER®)

Brief description: The TI:GER program is a multidisciplinary, experiential learning program focused on technology entrepreneurship. The program teams PhD students in science and engineering with MBA and JD students to examine issues surrounding the potential for commercialization of the PhD student thesis research. Students take the three course TI:GER sequence while continuing to pursue their degrees. Each team has a legal and a business mentor, and is given multiple opportunities to interact with industry advisors and the greater entrepreneurial community. The program is a 12 credit hour program, 9 credits of which can be used as a minor for the PhD students in the program.

Objectives:

TI:GER is primarily educational, with three objectives, to:

(i)   endow students with the multidisciplinary skills and entrepreneurial perspective needed to facilitate the creation and diffusion of new technology;

(ii)   encourage graduate student research with both technical and market relevance; and

(iii)   improve their understanding of how economic, regulatory, and legal mechanisms affect new venture creation, corporate entrepreneurship, and university-industry technology transfer.

Selection

Projects: Teamwork is centered on the PhD students' thesis research, which often produces platform technologies. Teams focus early on identifying opportunities for the research, as well as addressing which opportunities to tackle initially. In the second year of the program, students also participate in projects from the Atlanta Technology Development Center or from companies identified as TI:GER international projects. PhD projects are often in early stages of development, although some may be in prototype phase.

Teams: Teams are self-formed in the first two months of the program and consist of 5 students, one PhD, two MBA, and two JD students per team.

Screening: PhD students much be nominated by their advisor, submit an application including two letters of recommendation, a statement of their research, as well as a statement as to why they anticipate TI:GER participation benefitting their career goals. All PhD applicants are interviewed with a subset admitted, most with funding commitments from the Batts TI:GER endowment or other TI:GER source. MBA students apply when applying to Scheller and go through an interview process with TI:GER staff. JD students apply to the Emory TI:GER Director at the end of their first year at Emory Law.

Process:

The TI:GER process is highly structured.

Functional: The process is immersive process and comprised of team formation and coverage of team processes, identification of opportunities, intellectual property protection, industry analysis, strategy, customer discovery, and entrepreneurial finance

Documentation: https://www.scheller.gatech.edu/centers-initiatives/tiger/

Pedagogy:

Instructors: The instructors come from the Scheller and Emory Law faculty with significant involvement by members of the greater Atlanta entrepreneurial community.

Courses: The core of the program is a three-course sequence reflecting the process described above.

Course deliverables: The first course has two major deliverables: an IP assignment focused on patent search and freedom to operate, and an industry analysis. The deliverables for the second course are a finance assignment and commercialization plan. The third course has two deliverables: one for the PhD project, which may be a business plan, SBIR application or other real exercise; and one for the outside ATDC or international project, with the project depending on the outside company's needs. Each semester teams present to the TI:GER Advisory Board.

Mentors: Each team has a business mentor and a legal mentor. The mentor program is designed to connect TI:GER teams with professionals in Technology Commercialization who can help students learn from those currently active in the field about successfully taking technology from the lab to the marketplace.

- Provide student teams with practical advice about technology business creation and development from business and legal perspectives.
- Help students develop leadership and networking skills.
- Help students learn about their target industry's market opportunities and needs and develop contacts in their selected industry.
- Help students develop career paths.

Instruction: The courses are a mix of instruction and project work. The majority of the classes combine lectures with applications to the teams' specific projects. Students are routinely expected to present in class and become adept at communicating their projects in non-enabling ways to outside audiences.

Access to resources: Student teams have access to a wide array of resources through the Georgia Institute of Technology and Emory University. Along with the team mentors and TI:GER faculty, the TI:GER Advisory Board includes principals of law firms, venture angel investors prepared to introduce participants to the great entrepreneurial community.

Curriculum materials: A volume covering the topics in the first two core classes is used, authored by TI:GER faculty, funded by the Kauffman Foundation, and published by Emerald Publishing. Now available in its 2nd edition, the volume is "Technological Innovation: Generating Economic Results" 2nd edition," *Advances in the Study of Entrepreneurship, Innovation, and Economic Growth* Volume 26 edited by Sherry Hoskinson and Marie Thursby, 2016.

Tracks: There are currently no tracks by area of interest; although a children's healthcare track was provided in 2013. Other tracks may be considered in the future.

Institution: MIT

Program name: MIT delta v Accelerator (formerly known as Global Founders' Skills Accelerator) ("delta v" stands for the derivative of velocity which is acceleration)

Brief description:

- MIT delta v is an experiential skills accelerator for MIT student entrepreneurs to help them develop deep capability and confidence in building viable, sustainable & scalable ventures.
- The program is a capstone educational opportunity for entrepreneurial MIT students.
- We take the best teams ("people first, projects second") with an interesting idea or proof of concept and focus on the process of creating impactful, innovation-driven startups.
- For 2016, 17 teams spent their summer months at the Martin Trust Center with an emphasis on integrating rigorous methodology with experiential learning in a fully immersive three month environment that covers:
  - Team building / organization development and dynamics
  - Understanding their target market, customers, and users using primary market research
  - Creating value through innovation-driven product definition, prototyping, iternation and development
  - Capturing value in an economically sustainable way via unit economic analysis
  - Building out the rest of the venture (company formation, legal, financials, fund raising, sales, marketing, etc.)
- We provide space (to build the cohort for lateral learning), fellowships (of $2K/month per student so they can and must be full time), structure (in the form of just in time education, weekly check-ins, monthly board meetings that decide on milestone payments up to $20K per team as well as a full range of standard support like mentoring, maker spaces, introductions to specialist, etc.), status (in the form of exposure with big Demo Days in Boston, New York City and San Francisco)

Objectives:
This is the capstone educational program that our top students aspire to if they are serious about entrepreneurship. By its presence, it makes all the other courses and programs we run and support, much more effective.

Selection
Projects:
All industries but they have to be ambitious in their impact. They can be "for profit" or "not for profit" new ventures.
Teams:
Have to more than one person per team and there is a strong bias in selection to heterogeneous teams. In fact, we look for not only diverse teams but a diverse cohort as well.
Screening:

"People first, projects second" as we accept the team and explicitly not the idea. The team can change their mind but the team needs to have an idea to apply and it should be an ambitious idea but we accept that it can, and sometimes does, change dramatically after they have time to develop it further now that they are full time.

Process:

Stages:
1. First 30 days: "Who is your customer?" Teams do deep primary market research.
2. Next 30 days: "What can you do for your customer?" Teams focus on defining the product and refining this with the well defined customer from first month.
3. Last 30 days: Build out the rest of the venture and prepare for Demo Days.

Functional:
Teaching, mentoring, workshops, monthly board meetings.

Documentation:
A large portion of the program follows the 24 steps in the "Disciplined Entrepreneurship" book but they also do more (e.g., primary market research, financials, presentation skills, board skills, etc.)

Pedagogy:

Instructors:
Bill Aulet, Catherin Tucker, Matt Marx, EIRs (Trish Cotter, Donna Levin, Nick Meyer) and many specialists for

Courses:
This is not a course but builds off the courses they have already taken and aggressively puts what they learned in these classes into practice.

Course deliverables:
Monthly milestones presented and graded at board meetings

Mentors:
EIRS

Instruction:
Just In Time and more workshop oriented.

Access to resources:

- **Investors:** At Demo Day
- **Lab resources:** Yes. Maker Space at Trust Center but lots of other labs at MIT
- **Software/hardware engineering:** Yes
- **Legal:** Yes
- **Industry and service provider experts:** Yes

Tracks:
All

Institution: Stanford University

Program name: LaunchPad

Brief description: from Launchpad.stanford.edu:
It's the game-changing d.school class at Stanford for entrepreneurs. Our teaching philosophy is built around the culture of start-ups and what makes them tick. In the class Stanford students take an idea for a product or service and start a company in 10 weeks. Maybe one of the reasons it works is because we put our emphasis on the entrepreneurs, not the idea. Or maybe it's because we focus on doing, not planning. Or maybe it's because we don't believe in failure, only evolution. All we know is that it's totally different than other incubators or accelerators, and the proof is in the numbers: Since the annual class started in 2009, we've coached 90 companies to launch and over 50 are still in business.

Objectives:

Selection
Projects: We are not focused on the ideas, but the founders themselves – we look hard at the application pool (through personal interviews only) for founders that have shown persistence and a high tolerance of risk.

Teams: Open to any student team from any discipline, so long as they actually want to start a company. It's not a survey class, or a case study class, so having people who are committed to actually launching businesses is what is critical.

Screening: We host weekly "office hours" where we meet with founders. We are always screening for willingness to take action, and risk tolerance. We look for students who are always DOING in order to learn, not planning or researching. So if students come back having done what we asked, we give new assignments (yes, even before they're in the class). If they haven't done anything since the last we spoke (research is not doing), then we repeat what we already told them.

Process:

Stages: The class is a series of ~15 hurdles meaning 15 assignments over 20 class sessions

Functional:

Documentation: only the assignments and we use SLACK to communicate outside of the class – student are evaluated by use and by their customers at every hurdle and this is all transparent with the Launchpad class.

Pedagogy:

Instructors: Perry Klebahn and Jeremy Utley

Courses: LaunchPad

Course deliverables: Every course has an assignment and associated deliverable. Ultimate deliverable is a student, entrepreneuring. We consider it a gift if a student no longer considers themselves an entrepreneur (rather than persisting in saying, "I'm kinda thinking about doing this thing sometime…), or at least no longer considers an idea worthy of pursuing, but our ultimate deliverable is a founder capable of navigating the risks and complexities of running a start-up in the real world.

Mentors: Many practitioners and venture capitalists.

Instruction: Post-assignment-discussion driven. We give assignments and students bring results to class, and we discuss the results. We also set a few "learning traps" (surprises) that throw students off balance.

Access to resources:

- **Investors:** We invite a group of investors to a few classes to bring their lens to the evaluation of a particular hurdle
- **Lab resources:** None
- **Software/hardware engineering:** None
- **Legal:** None
- **Industry and service provider experts:** None

Tracks:

Institution: University of Toronto (Rotman School of Management)

Program name: Creative Destruction Lab Course

Brief description: The Creative Destruction Lab Course (CDL) is a hands on learning experience where students pair up and apply to real, science based ventures in our program. The MBAs do not form their own ventures, but rather, they provide a supporting role and help others achieve their objectives. This course is taken during the second year of the MBA program and runs from September-April. Recently, we have begun to accept a handful of commerce undergraduates to take the class.

Objectives:

The primary objective of the CDL course is equity value creation of our ventures. The MBAs are to draw upon skills learning in their first year and on past experiences in order to provide business development help for the ventures. Although we strive to make this a unique learning experience for our MBAs, the main objective is always equity value creation of our ventures.

Selection

MBA Screening: This is the most competitive course to take at Rotman. It requires a lengthy written application, and at least two interviews held by CDL team members and CDL course alumni. This is done to ensure that only serious students are admitted to the course.

Venture Screening: Ventures must go through their own screening process that involves a written application and many in-person interviews. Out of hundreds of applications, fifty are accepted to start our program in September (25 in Machine Learning and 25 in everything else). The lowest performing ventures are cut throughout the year and typically 24 (12 in each stream) will graduate from our program in June. Ventures are typically early stage (not yet seed funded) and are generally competing based on their technological advantage.

Process:

1. Students are put into groups and must evaluate and rank a stack of applications
2. Students have the opportunity to interview the ventures in their stack and then must re-rank these ventures
3. Students help the CDL decide which 50 ventures to accept in September
4. Students pair up and apply to work with ventures (after interviews and a pub night, ventures choose which MBA group they will work with for the rest of the year)
5. Students spend the rest of the year working closely working with their venture and are responsible for producing for their venture (at a minimum):
   a. Financial model
   b. Market evaluation
   c. Pitch deck
   d. Investment memo
   e. Video (similar to a "Kickstarter" video)

       f.   Sales or LOIs

This year, it is mandatory for students to also take the CDL entrepreneurial strategy class. The main objective in this class is to draw up two business plans for a single CDL venture (ex. One for a path that they took and then one for an alternate path).

Pedagogy:

Instructors: Primary instructor is Professor Ajay Agrawal. Professor Joshua Gans teaches the entrepreneurial strategy class and PhD student Rachel Harris manages all the logistics between and during classes.

Course deliverables: Each of the two courses has its own set of assignments. All assignments are considering to be useful for a CDL venture (ex. Financial model, etc.).

Mentors: Each team is assigned an academic faculty advisor and at least one business mentor. The goal is that the business mentors have both the ability to advise on general business issues and also have some relevant industry experience.

Instruction: There is little instruction in the main CDL course. There are a cluster of classes in September, but that is it for the year. Students are encouraged to figure out concepts on their own and to learn by doing. The entrepreneurial strategy class has set instruction classes throughout the year where students learn about different strategies (ex. Patent or compete, pivots, etc.).

Opportunities: We provide the students in the CDL course with many different opportunities (it is up to them whether they take them or not):
1. To "test drive" entrepreneurship
2. To meet Toronto and Bay Area Venture Capitalists
3. To meet successful Canadian and American entrepreneurs, turned angel investors
4. To work for a science-based venture and potentially get hired by them (this past year, 10% of our students joined their venture full-time, post MBA)
5. To test out the skills they learned in their first year of their MBA

Tracks: There are currently two tracks: one for Machine Learning and one for everything else. As time progresses, we will begin to add in additional tracks.