Turning Science into Business

Biotechnology Symposium
SUNY ESF
Syracuse NY
May 17th, 2018

Judy Albers
VanArsdale Chair in Entrepreneurship
SUNY Geneseo
Exciting Times!

- Advancing science, publish in prestigious journals, Nobel Prize
- Bayh-Dole Act in 1980 started exciting revolution
- IP is liberated, commercialization of inventions!
- Entrepreneurial movement begins, Stanford, MIT, and beyond
- Throughout the late 80s and 90s, universities set up OTTs
- Now, every campus boasts about entrepreneurship program
- Times and opportunities have changed, but not the question

*How do you turn science into business?*
Agenda

Strategies implemented and learned from:

• Pre-Seed Workshop
• Entrepreneurship Programs
• NSF I-Corps
• Geneseo Methodology
• Lessons from Failure
• Value of Failure
Problem Around Year 1999

- Entrepreneurial “ecosystem” in Upstate just emerging
- Tech Transfer Offices barely “there”; few tech commercialization programs exist
- Joined Trillium Group, seed and early stage VC
- Scientists seeking guidance would bounce btw lawyers, accountants, serial entrepreneurs, business professionals, eventually Trillium Group
- Confusion!
Problem in Early 2000s

- UR hires in Tech Transfer staff, RIT hires in a Director
- UNY starting to mobilize
- Obvious need!
- Quick turn-around, locally-based, efficient, effective methodology for turning science into business, and ...
- Sophisticated and busy demographic
- We create the Pre-Seed Workshop
What is the PSW?

PSW is a 2½ day “build-a-company” event which rallies community talent and resources to

1) investigate the commercial potential of new technologies

2) transform the more promising technologies into pre-seed stage companies
Well-Structured Teams

- 6-8 teams per workshop
- Simulate “real” start-ups
- Combine expertise in technology, business, finance, law, etc.
- Mix generations
- Everyone pulls in same direction
- Synergies are powerful!
- “Magic” in collective intelligence
Nine Idea Analysis Sessions

1. The Technology:  Do you have a proprietary product?
2. Technology to Market Map: To whom will you sell?
3. Market Need: Where is the pain?
4. Competition: Why will you win?
5. Value Propositions: Who cares?
6. Business Model: How will you operate?
7. Revenue Potential: How big is this opportunity?
8. Management Team: You and what army?
9. Technology Status: What does the roadmap look like?
Process and Product

• Facilitators lead teams through idea analysis sessions (1 hour each)
• Pose fundamental questions, give examples of how to answer questions, then each team would “break” for remainder of hour to answer questions
• Teams produce 12-13 slides for a 15 minute presentation
• On “Day 2”, panel of investors or community business experts provides feedback on 1) Do they have a business case? 2) Is it investable?
• Participants walk away with a “thin commercialization plan” and instructions on next steps
# Metrics, 15 Years

<table>
<thead>
<tr>
<th>Measures of Success</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshops Held</td>
<td>91</td>
</tr>
<tr>
<td>Ideas Analyzed</td>
<td>560</td>
</tr>
<tr>
<td>Teams Participating</td>
<td>560</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>3785</td>
</tr>
<tr>
<td>Host Cities in US and Abroad</td>
<td>11</td>
</tr>
<tr>
<td>Participating Universities</td>
<td>35</td>
</tr>
<tr>
<td>Participating Community Organizations</td>
<td>&gt; 300</td>
</tr>
<tr>
<td>Start-Ups Formed</td>
<td>~ 27% hit rate</td>
</tr>
</tbody>
</table>

Also, huge value in a pre-emptive “no”!
How Do you Turn Science into Business?

1. Make sure you know the most fundamental business questions and start answering those questions in a clear, concise manner.
Agenda

- Pre-Seed Workshop
- **Entrepreneurship Programs**
  - NSF I-Corps
  - Geneseo Methodology
- Lessons Learned from Failure
- Value of Failure
From Few to Many

Explosion of Programs !!!

National !!!
State !!!
Regional !!!
On-Campus !!!
Types of Programs and Events

• Programs on Customer Discovery, i.e., I-Corps, Nexus-NY
• Workshops on Pitching to Investors
• Business Plan Competitions
• Incubators and Incubator Associations
• Bootcamps for in-depth, topic-specific instruction
• Networking Events and Informational Sessions
• Angel Investing Groups, State Supported Seed Funds
• Investor Forums to pitch or get introductions to VCs
Programs in Upstate NY

https://uvc.org/uny-ecosystem-map/
How Do you Turn Science into Business?

2. Get involved in the programs that your campus and/or community offers; get mentors, support, and funding
Agenda

• Pre-Seed Workshop
• Follow-On Programs
• **NSF I-Corps**
• Geneseo Methodology
• Lessons Learned from Failure
• Value of Failure
All the Rage Now!!

- Started with Steve Blank, Stanford, Silicon Valley
- I-Corps Methodology all about "Talking to Humans"
- Aka,
  - Lean Start-up (before you spend a lot of money)
  - Customer Discovery (before you launch your business)
- Revolutionary Concept!!!!!!

Seriously, this is revolutionary?
Seems obvious, but many entrepreneurs weren’t doing it, still don’t
Instead of talking, they …
Instead of talking, entrepreneurs focus on products

Ref: "Talking to Humans", Giff Constable
Instead of talking, entrepreneurs make assumptions

Or when they do talk to other humans …

Ref: "Talking to Humans", Giff Constable
When they do talk to other humans, wrong people!

Ref: "Talking to Humans", Giff Constable
Or they ask the wrong questions

BEFORE WE GET TO OUR RISKY ASSUMPTIONS THAT COULD CRATER OUR ENTIRE BUSINESS, WHAT DO YOU THINK OF THE FONT COLOR ON THIS PACKAGING BURST?

Ref: "Talking to Humans", Giff Constable
Light Bulb goes off!

Dramatic Realization in Silicon Valley!

Entrepreneurs have to be taught how to talk to humans
UNY I-Corps Node

Innovation

We are part of the National Innovation Network (NIN), a national network of NSF-funded researchers from I-Corps™ Teams, I-Corps™ Nodes, and I-Corps™ Sites.
How Do you Turn Science into Business?

3. Get out of your lab/workshop/studio and talk to people; I-Corps will train you and pay you to do it.
Agenda

- Pre-Seed Workshop
- Entrepreneurial Training Programs
- NSF I-Corps
- **Geneseo Methodology**
- Lessons Learned from Failure
- Value of Failure
<table>
<thead>
<tr>
<th>Courses</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Program Elements</th>
<th>Pitch</th>
<th>Fest</th>
<th>Elimination</th>
<th>Validation by Experts</th>
<th>Building Process</th>
<th>NYBPC &amp; Doty Finals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PSW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Ideas</th>
<th>&gt;100</th>
<th>28</th>
<th>14</th>
<th>7</th>
<th>7 - 6</th>
<th>6</th>
<th>5</th>
<th>4-3</th>
<th>2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Knowledge about Ideas</th>
<th>Not Much</th>
<th>A lot</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Ability to Pitch Business Case</th>
<th>2-3 minutes</th>
<th>10-15 minutes</th>
<th>20 minutes</th>
<th>2-3 minutes</th>
</tr>
</thead>
</table>

- Fall: Courses, Key Program Elements: Pitch Fest, Elimination Process, Validation by Experts, Number of Ideas: >100, Knowledge about Ideas: Not Much, Ability to Pitch Business Case: 2-3 minutes
- Spring: Courses, Key Program Elements: PSW, Idea2Venture, Building Process, Number of Ideas: 28, Knowledge about Ideas: Not Much, Ability to Pitch Business Case: 10-15 minutes
- Summer: Courses, Key Program Elements: Regionals / State, Incubator Internships, Number of Ideas: 14, Knowledge about Ideas: A lot, Ability to Pitch Business Case: 20 minutes
Our Success at NYBPC

In five years with 36 teams, we have:

- Nearly 100% hit rate for team acceptance into Finger Lakes Semi-Finals
- At Regionals, out of 12 slots, we average 5 slots (42%) per year
- At State Finals, we have won:
  - 1st place – twice, in Biotech and Adv Tech
  - 2nd place – twice, both times in Clean Tech
  - 3rd place – once in SW/IT
  - Undergrad Excellence – six times across all tracks
  - Espirit de Corp – twice, in Products
How Do you Turn Science into Business?

4. Challenge yourself and vet your ideas by participating in Business Plan Competitions
Agenda

• Pre-Seed Workshop
• Entrepreneurial Training Programs
• NSF I-Corps
• Geneseo Methodology
• Lessons from Failure
• Value of Failure
Why Discuss This?

• Unfortunately, *in life*, “failure” is more common than “success”
• **We learn more from failure than success**
• Failure requires special handling and recovery strategies
• Especially true …
According to Bloomberg Report*

• 8 out of 10 entrepreneurs who start businesses fail within the first 18 months
• whopping 80% crash and burn

VCs report that
• only 1 in 10 of their portfolio companies succeed
• only 1 in 20 that received investments at the seed stage

* Entrepreneur 9/12/2013
Regardless of specific study or numbers, the message is that for start-ups, failure rate is high, success rate is low.
CB Insights conducted an analysis of 101 Failed Startups

Report: Valuable Lessons Learned

Rebecca Borison
Jul. 2, 2014, 11:54 AM

“There are a ton of startups trying to make it, and a lot of them just don't make the cut... Startups fail all the time. But a lot of the founders have really interesting advice... We've rounded up some of the best lessons you can takeaway from a failed startup.”
Top Five Reasons Start-Ups Fail

- No Market Need: 42%
- Ran Out of Cash: 29%
- Not the Right Team: 23%
- Get Outcompeted: 19%
- Pricing/Cost Issues: 18%
Gary Swart couldn't make his Dropbox-like startup Intellibank work because there wasn't a market need.

Even the best team with the best product will fail if its market does not exist.

#1 No Market Need

- Cited as the reason for failure in a notable 42% of cases
- Many start-ups built a solution when there wasn’t a problem (or a need or a desire) on the part of customers
- Or problem wasn’t big enough to create a scalable business
- Or pain wasn’t great enough that customers are willing to solve their pain at a price point that allowed the company to make a profit

*Lesson Learned:* Make sure your company is solving a problem, and make sure it’s big enough and that you have an affordable solution that customers are willing to pay for
Blurtt cofounder Jeanette Cajide couldn't save the startup from failure when it ran out of money.

Do not launch a startup if you do not have enough funding for multiple iterations. The chances of getting it right the first time are about the equivalent of winning the lotto.

#2 Cash !!

• Cited as the reason for failure in 29% of cases

• Getting up-front capital is tough; a number of founders cited that a **lack of financing** or investor interest was biggest challenge

• Even more noted that **figuring out how to spend their money**, once they had it, was a frequent conundrum

• They **spent it without getting the desired results** (i.e., didn’t get it right the first time) and eventually ran out; game over

*Lesson Learned:* Gauge your ability to raise cash before getting started. *If you do get cash, remember that “cash is king”. Spend it wisely. Ideally, get a cushion if you miss your first at bat.*
Greg Linden had to kill his startup Findory five years ago because they didn’t have the right internal or extended team.

A startup needs people who can provide expertise, credibility, and connections.

#3 Not the Right Team

- Cited as the reason for failure in 23% of cases
- Founders weren’t a diverse team with different skill sets, in technology, business, finance, law, etc.
- Leadership breakdown at the top
  - founder dysfunction
  - poor decision making
- This is why angels and VCs investigate the character of the founders and the team before investing

Lesson Learned: Assemble the **right team** with balanced skill sets, good advisors, extended network; ensure your team can execute
Findit CEO Levi Belnap and his team did not have success with their mobile search startup because customers *liked the competition better*.
#4 Not Competitive

- Cited as the reason for failure in 19% of cases
- Competition either had a **better product or better messaging**
- Failed start-up had no real **differentiation** or competitive advantages in the market, or unique value proposition
- Or, many **founders couldn’t articulate** it: “failure to communicate”

*Lesson Learned:* **Figure out the true value you bring to the table which is unique and different than other offerings, and make sure you can articulate that message clearly, concisely and compellingly**
4Chan founder Chris Poole shut down his artist community startup DrawQuest earlier this year because they couldn’t figure out how to make a profit.

Although we arguably found product/market fit, we couldn’t quite crack the business side of things.

#5 Not Profitable

- Cited as the reason for failure in 18% of cases
- Startup post-mortems highlight the difficulty in “right pricing”
- Product price point can’t be too high or customers might not buy it; can’t be too low because you have to make enough money to cover the costs of goods and operating the company and still make a profit
- Many start-ups failed to nail a profitable business model

Lessons Learned: Test your market and price points with a small amount of time and money, make sure you can earn a profit!!
How Do you Turn Science into Business?

5. Increase Your Odds for Success by Avoiding the Mistakes of Others
Mistakes of Others

• No Market Need
• Cash !!
• Not the Right team
• Not Competitive
• Not Profitable
How Do you Turn Science into Business?

Here’s what we have so far:

1. Make sure you know the answers to the most fundamental business questions
2. Get involved in the programs that your campus and/or community offers
3. Get out of your lab/workshop/studio and talk to people
4. Challenge yourself by participating in Competitions
5. Increase your odds by avoiding mistakes of Others
Agenda

• Pre-Seed Workshop
• Entrepreneurial Training Programs
• "Talking to Humans", NSF I-Corps
• Geneseo Methodology
• Lessons Learned from Failure
• Value of Failure
For individuals to create, innovate and strive for achievement, a healthy attitude towards failure and uncertainty is essential.

Without an appetite for these and the capacity to absorb the occasional failure that inevitably accompanies trying something new we deny ourselves the joy of discovery and the resulting benefits for society and ourselves.

Ref: http://www.thersa.org/fellowship/journal/archive/spring-2008/may-2008/the-joy-of-failure

We should talk more and teach more about failure …
Penn State has a course for engineering students called Failure 101

- students have to take risks and do experiments.
- the more failures they have, the sooner they can get an A grade!

Jack Matson, U of Houston, Innovative Design for Civil Engineers.

- Encourages students to take risks; he calls it “intelligent failure”.
- “You have to deal with the reality that it may take a hundred ideas to come up with one good one. From failure, you extract partial truths; from partial truths, good ideas are born.”
Ceramics teacher did an experiment for two groups of students,

- First group was graded solely on the **quantity** of work, 50 lbs gets A, 40 lbs gets B
- Second group was graded solely on the **quality**, one perfect pot to get an A.
- In the end, the **highest quality pots** were all produced by the group being graded for **quantity**.

“It seems that while the **quantity group** was busily churning out piles of work and learning from their mistakes, the **quality group** had sat theorizing about perfection and in the end had little more to show for their efforts than grandiose theories and a pile of dead clay.”
Train for Failure!

“People are training for success when they should be training for failure. Failure is far more common than success; poverty is more prevalent than wealth, and disappointment more normal than arrival.”

*J Wallace Hamilton*
Definition of Success

thesreedictionary.com, www.dictionary.com

**success (səkˈsɛs) n**

- the favorable or prosperous termination of attempts or endeavors.
- the attainment of wealth, profit, fame, popularity, position, honors, or the like.
- a person or thing that achieves these desired aims or attains prosperity.

**synonyms:** prosperity, affluence, wealth, riches, opulence, fame

**antonyms:** failure
Definition of Failure

fail•ure (ˈfeɪl yər) n.

• proving unsuccessful
• the condition or fact of being insufficient or falling short.
• a person or thing that is unsuccessful or disappointing
• a subnormal quantity or quality; an insufficiency

Synonyms: defeat, collapse, wreck, fiasco, catastrophe, disaster, let-down, blunder, misfortune, devastation, calamity, mishap, loser, disappointment, no-good, flop, wash-out, clunker, dead-duck, deficiency, inadequacy, bankruptcy, crash, collapse, ruin, going under, liquidation, insolvency

Antonyms: success
A Word of Caution

Ultimately, we all have to decide for ourselves what constitutes success or failure, but the world is quite eager to give you a set of criteria if you let it.

As an entrepreneurial community, we all have to decide for what constitutes success or failure.
“The moment one decides that failure is not an option, he inherently decides that success is not either because innovative ideas, creative thinking, and “out-of-the-box” options get stifled in a culture of fear and perfection.”

Terina Allen, President and CEO, ARV is Institute
If you’re not failing, you’re not growing.

“I’ve missed more than 9,000 shots in my career. I’ve lost almost 300 games. 26 times I’ve been trusted to take the game winning shot and missed. I’ve failed over and over and over again in my life. And that is why I succeed.”

– Michael Jordan
Failures that Changed the World

**Albert Einstein:** Didn’t speak until he was four and didn’t read until he was seven, causing his teachers and parents to think he was mentally handicapped. Eventually, he was expelled from school and refused admittance to the Zurich Polytechnic School.

**Thomas Edison:** In his early years, teachers told Edison he was "too stupid to learn anything." Work was no better. He was fired from his first two jobs for not being productive enough.

**Winston Churchill:** Churchill struggled in school and failed the sixth grade. After school he faced many years of political failures. He was defeated in every election for public office until he finally became the Prime Minister at the age of 62.

**Abraham Lincoln:** In his youth he went to war a captain; demoted to a private. He started numerous failed business and was defeated in numerous runs for public office.

More Failures

**Fred Astaire**: In his first screen test, the testing director of MGM noted that Astaire, "Can't act. Can't sing. Slightly bald. Can dance a little."

**The Beatles**: When they were just starting out, a recording company rejected them because "we don't like their sound, and guitar music is on its way out."

**Babe Ruth**: Held a home run record of 714 during his career, but had 1,330 strikeouts as well. For decades he held the record for career strikeouts.

Failures in Business

**Henry Ford**: His early businesses failed and left him broke five times before he founded the successful Ford Motor Company.

**R. H. Macy**: Macy started seven failed business before finally hitting big in NYC

**Bill Gates**: After dropping out of Harvard and starting a failed first business with Microsoft co-founder Paul Allen called Traf-O-Data. This early idea didn't work

**Harland Sanders**: His famous secret chicken recipe was rejected over 1000 times before a restaurant accepted it.

**Walt Disney**: He was fired by a newspaper editor because, "he lacked imagination and had no good ideas." After that, Disney started a number of businesses that ended with bankruptcy.

**Note**: On average, entrepreneurs suffer through 3.8 failures before they finally succeed.

Handling Failure

- Stay motivated
- Be resilient
- Recognize the benefits!
- Let it prompt innovation and
- Result in greater opportunity
- Always, take away lessons learned

As Tom Kelley of IDEO puts it, ‘fail often to succeed sooner.’

Soichiro Honda, the founder of Honda said, “Many people dream of success. Success can only be achieved through repeated failure and introspection. Success represents the 1 per cent of your work that results from the 99 per cent that is called failure.”
How Do you Turn Science into Business?

1. Make sure you know the answers to the most fundamental business questions
2. Get involved in the programs that your campus and/or community offers
3. Get our of your lab/workshop/studio and talk to people
4. Challenge yourself by participating in Competitions
5. Increase your odds by avoiding mistakes of Others

Conclusion
One More Thing …

Don’t let the world define success or failure for you/us

Be creative! Take risks!

Don’t be afraid of failure

Dream big anyways!
Thank You!