Evidence Based Entrepreneurship™ to Improve (STEM) Education
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NSF I-Corps Champions
Founders/Developers

Steve Blank

Jerry Engel

National Faculty Director
I-Corps™

Lean LaunchPad® Developer
I-Corps™ L History

- June 2013 – Called to serve
- January – February 2014 – Pilot cohort
- March – November 2014 - Redesign
- January – February 2015 – Full cohort
- March – May 2015 - Redesign
- July – August 2015 – Full cohort
- January – February 2016 – Full cohort planned
- ?
The Growing Network of I-Corps™ L Teams!
## Examples of I-Corps™ L Team Innovations

<table>
<thead>
<tr>
<th>Concept Warehouse</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Concept Warehouse</strong></td>
<td>Platform that improves teaching effectiveness by speeding the propagation of evidence-based instructional practices among STEM faculty.</td>
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<tr>
<td><strong>Carpal Coding</strong></td>
<td>Bridge the gap in algorithm development and syntax for novice makers to program microcontrollers.</td>
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<td><strong>CryptoClub</strong></td>
<td>CryptoClub is an engaging curriculum for middle-grade students to explore mathematics and cryptography in afterschool settings and online.</td>
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<td><strong>ELeVATE</strong></td>
<td>Holistic transition program that supports veterans interested in engineering and technology careers, and educates faculty and staff on how to set veterans up for success in college and beyond.</td>
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<td><strong>HEIR Corps</strong></td>
<td>Humanoid Engineering with Inexpensive Robots (HEIR) Corps is dedicated to providing a low-cost, socially intelligent humanoid robot platform for K-12 institutions that can enhance STEM and computer science education.</td>
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<td><strong>PictureSTEM</strong></td>
<td>PictureSTEM curricula provide a model of STEM integration for grades K-2 that employs engineering and literacy contexts to integrate science, technology, and mathematics content in meaningful and significant ways.</td>
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<td><strong>Scaling the PERC Program</strong></td>
<td>The Peer Enabled Restructured Classroom (PERC) Program leverages peer leadership to transform struggling secondary schools into academic successes.</td>
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<tr>
<td><strong>Team ViTAL: Vibratory Touchscreen Applications for Learning</strong></td>
<td>Team ViTAL's innovation leverages commercially available touchscreens and custom software to translate visual content displayed on a screen into content that can be felt (vibrations) and heard (sound).</td>
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<td><strong>WorkReadyGrad</strong></td>
<td>WorkReadyGrad connects students with employers and alumni in STEM, so that students can proactively develop the right skills and network to become &quot;work ready&quot; by the time they graduate.</td>
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Example Team (ELeVATE)

- Holistic transition program that supports veterans interested in engineering & technology careers
- Educates faculty and staff on how to set veterans up for success in college and beyond
- Data Collected: 102 interviews

ELeVATE – I-Corps L Pilot Team 5
Example of Sustaining & Scaling Success

A Project that is a Program:

<table>
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<tr>
<th>Team</th>
<th>Started with:</th>
<th>Ended with:</th>
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</table>
| 7 ELeVATE (Experiential Learning for Veterans in Assistive Technology & Engineering) | • Single transition program at one institution for veterans interested in STEM  
• Sole funding option: more grants | • Multiple institutions (8 institutions already recruited)  
• 2 new customers: Senior administrators at veterans organizations, and STEM faculty with joint appointments at the VA  
• 2 new program services: Consulting (evaluation, recruitment), and Data (gathering, analysis, publication)  
• Several new funding options: franchise fee, consulting fees  
• 14 new potential partners identified, including Google, Kognito LLC, Wounded Warrior Project, Semper Fi fund |
Two Parts to Educational Innovation

1. Advancing the science/technology [research]
2. Finding a repeatable business model

- Current efforts focus on #1
- Successful efforts require both
Answers to Hypotheses are **Outside** Your Office/Lab

- You may be the smartest person in your setting
- But you are not smarter than the collective intelligence of your potential adopters, users, customers, partners, payers and regulators
- You can’t learn this by reading papers or listening to lectures

*You need to get outside your building*
Taking you from an Idea to a Business (Sustainable Scalability)

The Lean Startup In Three Steps
1. Frame Hypotheses

- Frame Hypotheses
1. Frame Hypotheses

- Frame Hypotheses

⇒ Business Model Canvas

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<th>Key Partners</th>
<th>Key Activities</th>
<th>Value Propositions</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
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- Partners

- Activities

- Key Resources

- Value Propositions

- Customer Relationships

- Customer Segments

- Get/Keep/Grow

- Product / Service

- Channel

- Cost Structure

- Revenue Streams

- Costs

- Revenue

[Image of Business Model Canvas]

www.businessmodelgeneration.com
2. Test Hypotheses

- Frame Hypotheses ➔ Business Model Canvas
- Test Hypotheses
2. Test Hypotheses

- Frame Hypotheses ➔ Business Model
- Test Hypotheses ➔ Customer Development
3. Build Incrementally & Iteratively

- Frame Hypotheses ➔ Business Model
- Test Hypotheses ➔ Customer Development
- Build the product incrementally & Iteratively ➔ Agile Engineering
The Result:
Evidence-based Entrepreneurship
Teaching Team
I-Corps™ L Teaching Team Network

Stephen L. Canfield  
Tennessee Technological University

Dean Chang  
University of Maryland

Shawn Jordan  
Arizona State University

Micah Lande  
Arizona State University

Russell Korte  
Colorado State University

Lydia McClure  
Austin Technology Incubator

Ann McKenna  
Arizona State University

Todd Morrill  
Venture Management Group

Heath Naquin  
Next Generation Photovoltaics

Heidi Olinger  
Pretty Brainy

Karl Smith  
University of Minnesota & Purdue University

Christopher Swan  
Tufts University

I-Corps™ L Teaching Assistants

Lindsey Mitchell  
DC I-Corps™

Brandy Nagel  
Georgia Tech, VentureLab

I-Corps™ L Logistics Team

Rocio Chavela  
ASEE

Tengiz Sydykov  
ASEE
Evaluation Team

Gary Lichtenstein  Cathleen Simons  Sheri Sheppard

Quality Evaluation Designs
Education Research, Evaluation, Policy
GARY LICHTENSTEIN, E.D.D.

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