I-Corps™ for Learning
Sustaining and Scaling STEM Education Innovations for Impact

ASEE/IEEE Frontiers in Education Conference – October 13, 2016 – T2B – 1:30 pm – 3:00 pm

Facilitated By

Rocio Chavela Guerra
American Society for Engineering Education

Karl A. Smith
Purdue University and University of Minnesota

Agenda

<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Introduction of Session and Facilitators</td>
<td>5 min</td>
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<tr>
<td>Brief introduction to the I-Corps™ for Learning Program</td>
<td>10 min</td>
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<tr>
<td>• History</td>
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<tr>
<td>• Goals</td>
<td></td>
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<tr>
<td>• Current Initiatives</td>
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<tr>
<td>Lean Start-Up Approach</td>
<td>25 min</td>
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<tr>
<td>• Business Model Canvas</td>
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<td>• Customer Discovery Process</td>
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<tr>
<td>• Agile Engineering – Iterate &amp; Increment</td>
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<tr>
<td>Customer Segments (CS) and Value Proposition (VP) Exercise</td>
<td>30 min</td>
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<tr>
<td>• Identify an education innovation that you would like to see sustained and scaled</td>
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<tr>
<td>• Within that innovation identify one Value Proposition (VP) that you think is aligned with one Customer Segment (CS)</td>
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<tr>
<td>Summary and Feedback</td>
<td>10 min</td>
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7-week Program

Educational Innovation

Customer Discovery

Kick-off Workshop  |  5 Online Sessions  |  Lessons Learned Workshop

100 Interviews

Readiness for Sustaining & Scaling?

I-Corps™ for Learning History

<table>
<thead>
<tr>
<th>June 2013</th>
<th>June 2014</th>
<th>June 2015</th>
<th>June 2016</th>
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<tbody>
<tr>
<td>Pilot: Jan-Feb 2014</td>
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<td>Cohort 1: Jan-Feb 2014</td>
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<td>Cohort 2: Jul-Aug 2015</td>
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<td>Cohort 3: Jul-Aug 2016</td>
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3 Cohorts + Pilot
73 Teams
234 Participants
18 Instructors
3 Evaluation Partners
Key Features of I-Corps™ for Learning

- **Curriculum**
  - Business Model Canvas
  - Customer Discovery
  - Agile Engineering

- **Course Specific Outcomes**

- **Assessment Instruments**

- **Syllabus Iterations**

- **Balanced Teaching Team**

- **Diverse Participant Segments**

- **Teams Composition**

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**Participant/Alumni Segments**

- **Current Profession Leaning** (36%)

- **Entrepreneur Leaning** (20%)

- **Both** (44%)
ViTAL

Bringing inclusion and accessibility to the digital classroom through touch

Jenna Gorlewicz, PI
Assistant Professor
Saint Louis University

Corrine Mueller, EL
Graduate Assistant
Southern Illinois University Edwardsville

Dan Harres, M
CEO
Bitstream Technology

TAKING YOU FROM AN IDEA TO A BUSINESS (SUSTAINABLE SCALABILITY)

The Lean Startup In Three Steps
1. Frame Hypotheses

- Frame Hypotheses

Business Model Canvas

- Key Partners
- Key Activities
- Value Propositions
- Customer Relationships
- Customer Segments
- Partners
- Activities
- Product / Service
- Get/Keep/Grow
- Customers
- Key Resources
- Resources
- Channels
- Channel
- Costs
- Revenue Streams
- Revenue

www.businessmodelgeneration.com
2. Test Hypotheses

- Frame Hypotheses ➔ Business Model Canvas
- Test Hypotheses ➔

2. Test Hypotheses

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

- Frame Hypotheses ➔ Business Model
- Test Hypotheses ➔ Customer Development
- Build the product incrementally & iteratively ➔ Agile Engineering

Activity: Choosing an Educational Innovation

- Individually,
  - Identify an educational innovation you would like to see scaled
  - Write 1-2 sentence(s) describing the innovation

- In small groups (2-3 people),
  - Share the innovations you identified and select one for the group
  - If needed, re-write 1-2 sentence(s) describing the innovation
Examples

**Product Realization 2.0**

We help engineering companies identify talent, and students get their first internship, through a sponsored experiential interview that demonstrates targeted skills.

**INTERVIEWS**

<table>
<thead>
<tr>
<th>New</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>78</td>
</tr>
<tr>
<td>10</td>
<td>101</td>
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</table>

**Team 61**

**JUR Press**

JUR is a journal for undergraduates, by undergraduates that engages students throughout the publication process, providing a place to publish their work as well as a single source for finding internships and research opportunities.

Jessica Egner
Entrepreneurial Lead

Mark Brown
Principal Investigator

Mark Combes
Mentor

Melissa Edwards
Mentor

**Interview Count**

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<tbody>
<tr>
<td>101</td>
<td>99</td>
<td>1</td>
<td>1</td>
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</table>
Lean Startup isn’t explicitly about starting a company…

It’s really about how to maximize the number of people you help and impact (i.e. the business model)

Scaling and Value

Scaling

100 students ➔ 100,000 students ➔ 1,000,000+ students

Who will pay for you to provide value to those 100,000 or 1,000,000+ students?
Examples

2012 Overall Expenses: $7.3M
• $5.1M just in salary expense
2012 Total Revenue: $15M
• Almost all from donations
• $500,000 fees for services

• Non-profit doesn’t mean you shouldn’t charge for the value you deliver!
• In fact, it’s imperative that you do figure out what you can charge for and who will pay (other than students & teachers).

That’s why we start with these
**Customer Segments**  
*(Does Anyone Care?)*

Who are your most important customers?  
What job do they want to get done?

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**Value Propositions**  
*(Why Do They Care?)*

What customer problems are you helping to solve?  
What customer needs are you satisfying?
Mistake #1
Building Something Nobody Wants!

Value Propositions
(Why Do They Care?)

Key Partners  
Key Activities  
Value Propositions  
Customer Relationships  
Customer Segments

Key Resources  
Channels

Cost Structure  
Revenue Streams
### The Value Proposition

A **value proposition** is a promise of value to be delivered. It is a clear statement that:

- explains how your innovation solves customers’ problems or improves their situation (**relevant**),
- delivers specific benefits (**descriptive, measurable**),
- tells the user or buyer why they should use it or buy from you and not from the competition (**unique**).

http://conversionxl.com/value-proposition-examples-how-to-create/#.

### Features vs. Value Propositions

<table>
<thead>
<tr>
<th>Features</th>
<th>Weak Value Propositions</th>
<th>Strong Value Propositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fun &amp; Engaging</td>
<td>Faster, Cheaper, Better</td>
<td>Relevant, Significant &amp; Testable Product Benefits</td>
</tr>
<tr>
<td>Field-specific skill building</td>
<td>Getting students involved with an undergraduate publication</td>
<td>Increase number of good applicants for graduate schools</td>
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</table>
Customer Segments
(Does Anyone Care?)

Customer Segments

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Buildings, Organizations</td>
<td>Broad Groups of People</td>
<td>Very Specific Job Titles, Very Specific Archetypes/Personas</td>
</tr>
<tr>
<td>Colleges</td>
<td>Faculty</td>
<td>Newly Hired, Tenure-track Engineering Faculty</td>
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</table>
Customer Segments (CS) and Value Propositions (VP) Alignment

What makes for a compelling value proposition?

- What problem are you solving/need are you serving?
- How?
- For whom?
Customer Jobs: What do they have to do and how do they do it now?

Jobs
- Functional
- Social
- Emotional
- Supporting

Job's contexts
Job's importance

Customer Pains: What annoys your customers?

Pains
- Undesired outcomes
- Obstacles
- Risks
- Difficulties

Severity
Customer Gains: What do they want?

Gains
- Functional
- Social
- Emotional
- Resourceful

Relevance
- Required
- Desired
- Expected
- Unexpected

Products & Services: What are you offering?

Products & Services
- Physical, tangible
- Intangible

Relevance
Gains Creators
• Expectations
• Desires
• Utility
• Unexpected

Gain Creators: How do you provide positive results and benefits?

Pain Relievers
• Undesired outcomes
• Obstacles
• Risks
• Difficulties

Pain Relievers: How do you alleviate customer pains?
Value Proposition Customer Segment Ad Lib

CS

Customer Segment: Which people? Be specific!

would “pay” to __________________________

Value Proposition: Solve this problem

in a way that __________________________

Verb (reduces, increases, etc.)

________________________
a specific Customer Pain or Gain

(Unlike __________________________)

Extra Credit: How is it different than the competition?

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The Value Proposition Canvas

61: JUR Press

VP: Increase number of good applicants for graduate/professional schools

- Peer reviewed undergraduate publication
- Registered with the Library of Congress
- Student run and self-sustaining

- Undergraduate-focused demographic
- International publication

CS: University Department Chairs/Directors (Admissions)

- Increased total number of applicants
- Widespread knowledge of their program
- Visibility on an international platform

- Recruit students to their programs (grad & undergrad)
- Guide students through their degree
- Prepare students for employment or grad school

- Small advertising budgets
- Limited “local” reach
- Does not draw diverse student pools
- Lacking desired number of applicants

Gain Creators

- College programs listed and exhibited
- Cost less than traditional ads
- Higher visibility; international undergrad audience

Pains

- Undergraduate-focused demographic
- International publication

Customer: JUR Press
Customer Segment and Value Proposition Alignment

### Kick-off – Class 1

**STEM-Packs**
Introducing modular, standards-based, PreK-8 STEM learning into public library Summer Reading Club by connecting literature with STEM activities

<table>
<thead>
<tr>
<th>Value Proposition</th>
<th>Customer Segment</th>
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<tbody>
<tr>
<td>Library Directors</td>
<td></td>
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<tr>
<td>School Districts - continuous STEM</td>
<td></td>
</tr>
<tr>
<td>Educators</td>
<td></td>
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<tr>
<td>Family Members</td>
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### Wrap-up – Class 10

**Story Time STEM Packs**
Integrating science, math, and engineering activities with children’s literature

<table>
<thead>
<tr>
<th>Value Proposition</th>
<th>Customer Segment</th>
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<tbody>
<tr>
<td>Increase SRC &amp; other library</td>
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<tr>
<td>Increase comfort level with</td>
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<tr>
<td>Assure standards-based</td>
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<tr>
<td>Decrease activity</td>
<td></td>
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<tr>
<td>Increase entry into STEM</td>
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<tr>
<td>Library Directors</td>
<td></td>
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<tr>
<td>Library Directors without</td>
<td></td>
</tr>
<tr>
<td>Librarians with education/STEM</td>
<td></td>
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<tr>
<td>Librarians without</td>
<td></td>
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<tr>
<td>Part-time and small libraries</td>
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<tr>
<td>Library Director/Decisions</td>
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#### Value Propositions
- Decrease activity preparation time to 20 minutes or less

#### Customer Segments
- Part-time and small library staff

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**Customer Segments (CS) and Value Propositions (VP) Exercise (~30 min)**

- **Participants work individually on:**
  - Describing their innovation in 1-2 sentences (from previous example)
  - Identifying one VP that is aligned with one CS using the Value Proposition Canvas

- **Participants work in pairs to provide feedback and revise their work**

- **Pairs share their work with the group**
The Growing Network of I-Corps™ L

New Courses

<table>
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<tr>
<th>Awareness Sessions</th>
<th>Introduction to I-Corps™ L</th>
<th>National Cohort</th>
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<tbody>
<tr>
<td>1-3 hours</td>
<td>2 weeks</td>
<td>7 weeks</td>
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<tr>
<td>Face-to-Face</td>
<td>Online</td>
<td>Hybrid</td>
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<td>Online</td>
<td>Hybrid</td>
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- Introduction to core features of the Lean Startup Process
- Focus on the importance of sustainable scalability at the early stages of concept development
- Opportunity to develop ‘proof-of-concept’ evidence towards sustaining and scaling
- Focus on Value Proposition + Customer Segment ‘fit’

Frontiers in Education (FIE)
October 12-15, Erie, PA

*ASEE Annual Conference
June 25-28, Columbus, OH

- Opportunity to determine innovation readiness for sustainable scalability
- Immersion in the Lean Startup Process

? (traditionally Jul-Aug)
Acknowledgments

We acknowledge the National Science Foundation (NSF) for funding (NSF DUE-1355431, DUE-1451245, NSF DUE-1355391, and DUE-1450644).

We acknowledge the American Society for Engineering Education (ASEE) and IEEE Frontiers in Education Conference for hosting.

I-Corps™ for Learning

https://www.asee.org/i-corps-l/
Thank you!

An e-copy of this presentation will be posted to:
www.asee.org/i-corps-l