SMART START
DESIGNING IMPACT-DRIVEN PROJECTS

ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

NSF

47th Frontiers in Education (FIE) Conference • Indianapolis, IN • October 18, 2017

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Agenda

Introduction of session and facilitators	5 min
Brief introduction to Smart Start: Designing Impact-driven Projects	15 min
Participants identify a research-based innovation that they want to sustain and scale	30 min
The Lean Start-Up process	20 min
Customer Segments (CS) and Value Propositions (VP) Exercise	30 min
Customer Discovery Exercise	30 min
Customer Discovery Practice	30 min
Next Steps	10 min

Survey - https://www.surveymonkey.com/r/SmartStartFIE17

Current Initiatives

Awareness Sessions	Smart Start	National Cohort
1-3 hours	2 weeks	7 weeks
Face-to-Face Online	Online Hybrid	Hybrid
• 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'	• Opportunity to determine innovation readiness for sustainable scalability • Immersion in the Lean Startup Process
League for Innovation Learning Summit – June 2017 **Frontiers in Education (FIE)** October 2017, Indianapolis, IN	• **Course I: Online** February 17 – March 5, 2018 • **Course II: Blended** March 17 – April 2, 2018	**??** (traditionally Jul-Aug)

Slide 1

I-CORPS-L → Events

Smart Start: Designing Impact-driven Projects

I-Corps™ L Opening Workshop - Classroom Picture. Cohort: 2016 Washington, DC Metro Area

About the Course

ASEE's Smart Start is a two-week course for researchers and innovators who are passionate about taking their STEM education vision to the next level –but don't quite know how to get there. This course will give you a convenient, low-barrier introduction to making your research available to the public. When you accept the challenge, you will:

- Connect with leading experts in the fields of education and innovation, as well as like-minded peers.
- Learn how to develop an effective proof-of-concept, saving time and resources.
- Awaken your inner entrepreneur.
- Learn more about innovation programs like NSF I-Corps™ and I-Corps™ for Learning (I-Corps™ L) and how to get involved.
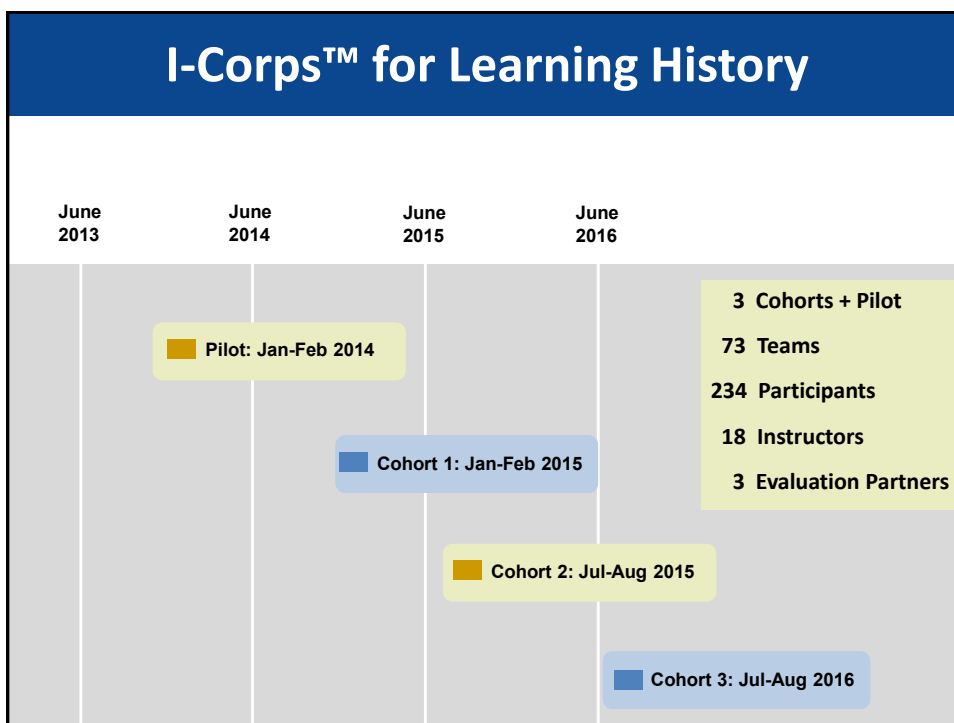
Dates

COURSE I: Online (February 17 – March 5, 2018)

- Application Period: October 25 – November 23, 2017
- Acceptance Notification: December 8, 2017
- Kick-off Workshop (Online): February 17, 2018, 9 AM – 5 PM ET
- Office Hours (Online): Two one-hour sessions (arranged with instructors)
- Closing Workshop (Online):March 5, 2018, 1 PM – 4 PM ET

COURSE II: Bended (March 17 – April 2, 2018)

- Application Period: November 22 – December 27, 2017
- Acceptance Notification: January 10, 2018
- Kick-off Workshop (National Harbor, MD): March 17, 2018, 9 AM – 5 PM ET
- Office Hours (Online): Two one-hour sessions (arranged with instructors)
- Closing Workshop (Online): April 2, 2018, 1 PM – 4 PM ET

https://www.asee.org/i-corps-l/events/smart-start

Slide 2

I-Corps™ for Learning History

| June 2013 | June 2014 | June 2015 | June 2016 | |

Pilot: Jan-Feb 2014

Cohort 1: Jan-Feb 2015

Cohort 2: Jul-Aug 2015

Cohort 3: Jul-Aug 2016

3 Cohorts + Pilot

73 Teams

234 Participants

18 Instructors

3 Evaluation Partners

7-week Program

Educational Innovation	(logos of educational technology companies)
Customer Discovery	**Kick-off Workshop** — **5 Online Sessions** — **Lessons Learned Workshop** / **100 Interviews**
Readiness for Sustaining & Scaling?	Product / Market — Fit

Two Parts to Innovation*
(including Educational)

1. Advancing the science/technology [research]

2. Finding a repeatable business model

- **Current efforts focus on #1**

- **Successful efforts require both**

*Innovation - **the adoption of a new practice in a community**.
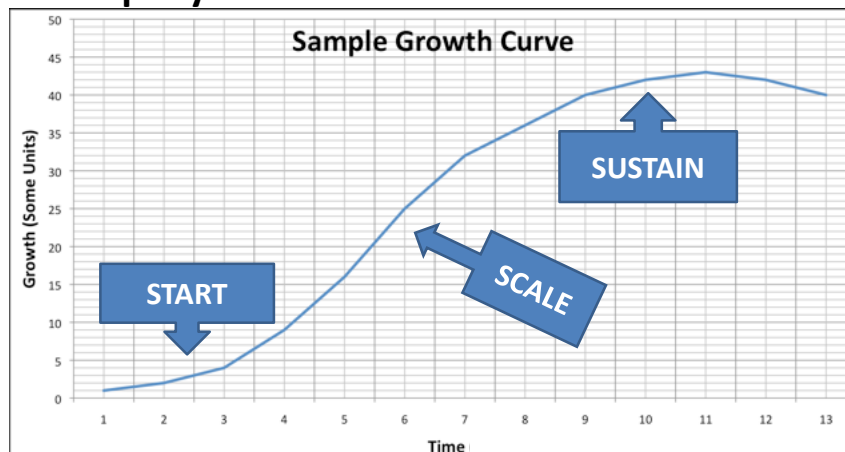Denning and Dunham (2010) *The Innovators Way*. MIT Press

8

Lean Start-up Method

Lean Start-up isn't just about starting a company …

It's really about how to maximize the number of people you help and impact

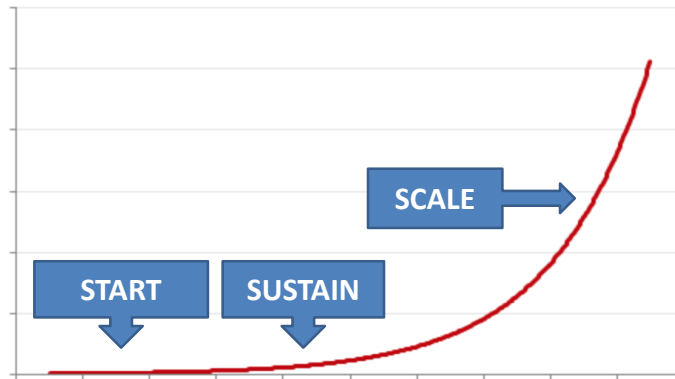**Business Modeling & Mission Modeling**

Lean Start-up Method

Lean Start-up isn't just about starting a company …

Lean Start-up Method

Lean Start-up isn't just about starting a company …

Examples

KHAN ACADEMY: our mission is to provide a free world-class education for anyone, anywhere.

CAN'T WAIT TO LEARN: Children in areas of conflict, without access to schools or teachers, learn by playing serious educational games on tablet computers.

ELeVATE: a three-phased program designed to re-integrate veterans to college.

U-FUTuRES 2.0: professional development of middle school science teachers to be effective Science Teacher Leaders.

Research-based Innovations

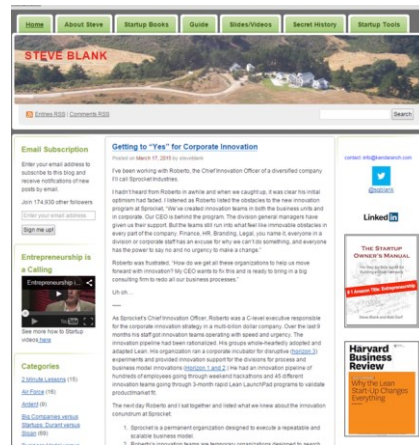**Think about educational innovations**

Pair up and discuss each other's ideas about how to spread these educational innovations across education

Be ready to report out

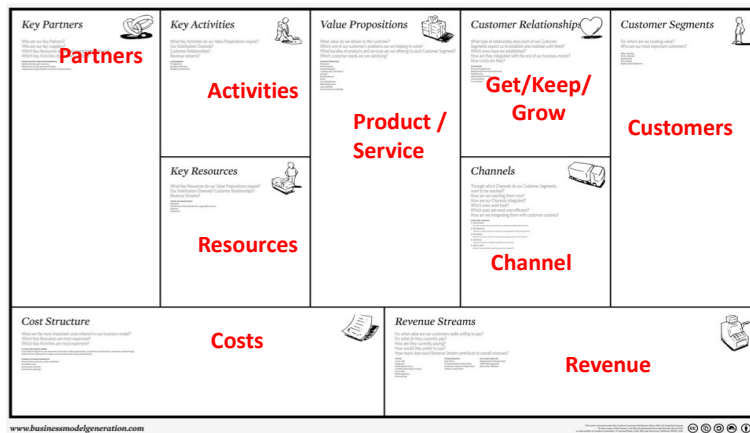## Lean Startup
Three Steps to Taking an Idea to a Business

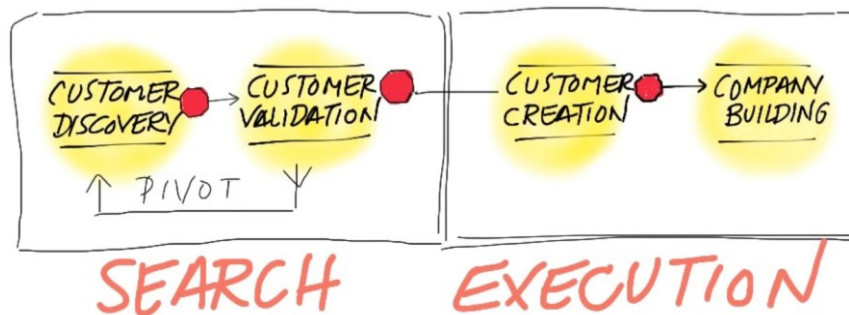Steve Blank, Lean LaunchPad® Developer

www.steveblank.com

1. Frame Hypotheses

• Frame Hypotheses ➔ Business Model Canvas

2. Test Hypotheses

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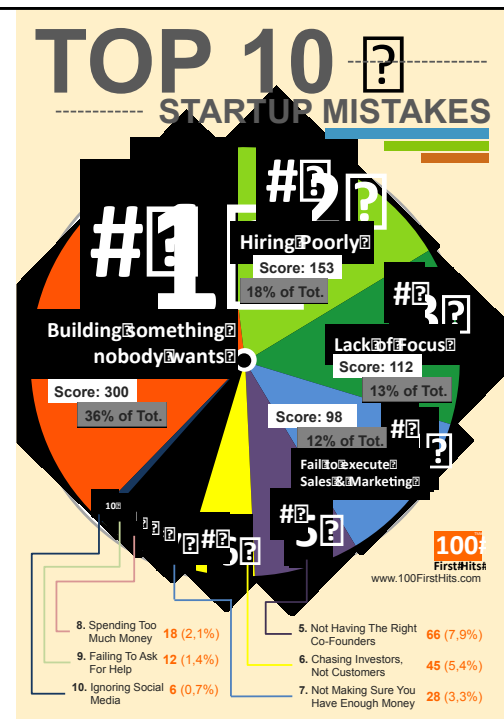
• Test Hypotheses ➔ Customer Development
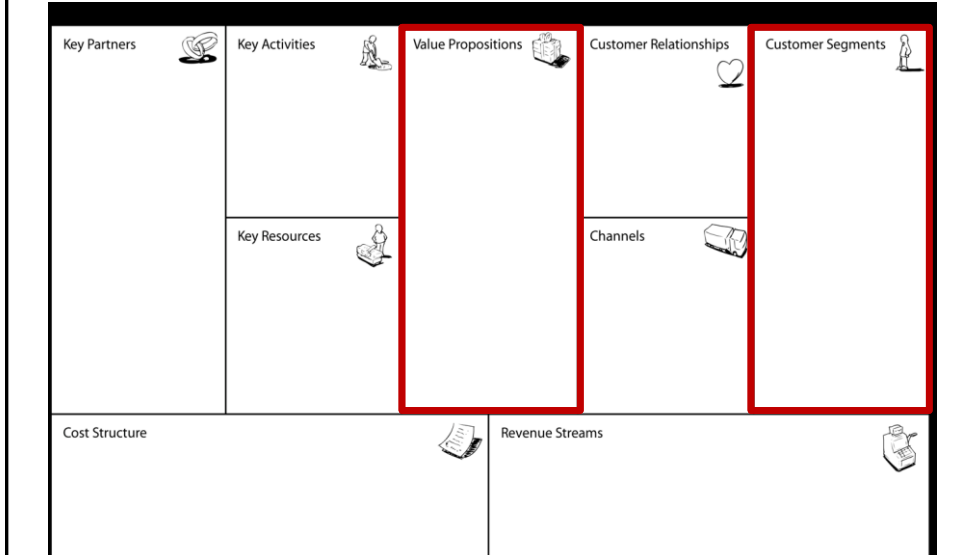
3. Build Incrementally & Iteratively

- Frame Hypotheses → Business Model
- Test Hypotheses → Customer Development
- Build the product Iteratively & Incrementally → Agile Engineering

Mistake #1

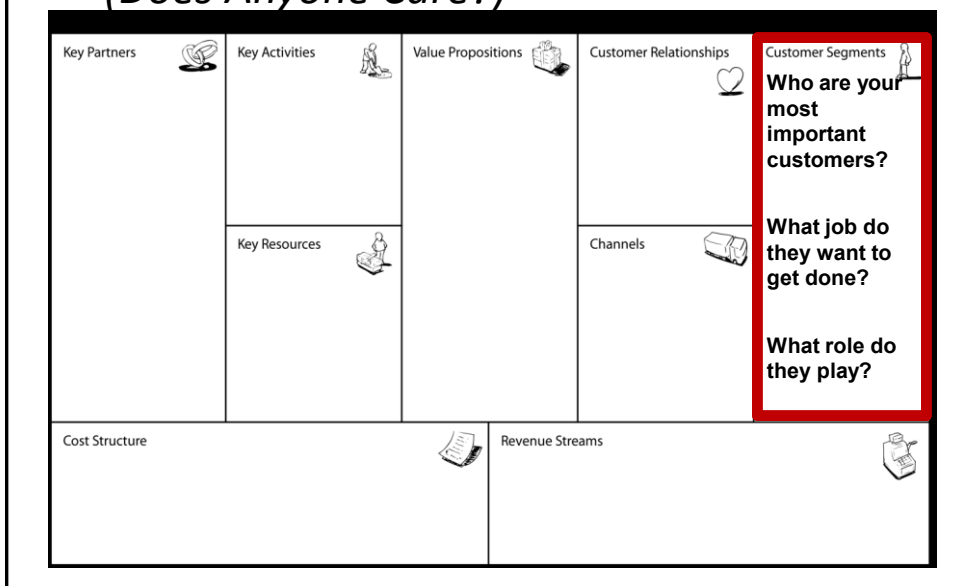**Building Something Nobody Wants!**

9

That's why we start with *these*

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure			Revenue Streams	

Customer Segments
(Does Anyone Care?)

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
				Who are your most important customers?
	Key Resources		Channels	**What job do they want to get done?**
				What role do they play?
Cost Structure			Revenue Streams	

CS Roles

Beneficiary	An individual or group benefitting from an innovation
End User	The day-to-day users of a product or service Possibly have the least influence
Decision Maker	Those having the ultimate/final purchasing authority
Payer	Those that control the purchase of products or services
Influencer – **Recommender –** **Skeptic –**	Informants, opinion leaders with persuasive power An individual or group with powerful influence to buy Their influence can slow or stop the purchase

21

Big Idea: Multiple CS Roles

– *The Payer/Decision Maker may be different from the End User/Beneficiary*

– *Each Role in a CS has its own specific VP*

General Electric

DOUG DIETZ
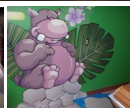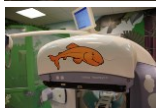
PRINCIPAL DESIGNER, GE HEALTHCARE

Procedural Theater UPMC 'Jungle Adventure' Pilot Install

Before

After

Interactive Jungle theme
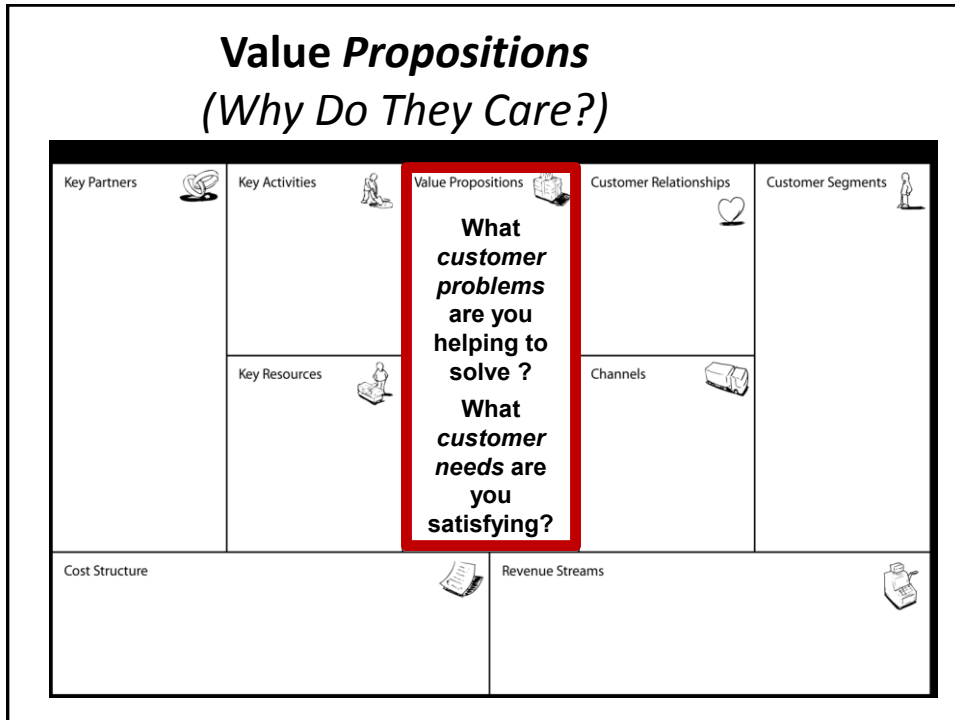Log ride (table)
Waterfall- Koi fish pond floor
3D Jungle walls
LED light effects, Aroma diffuser, sounds

CS Roles & Unique VPs:
MRI Adventure

- *Beneficiary – Kids/Parents,* ☺ ☺ ☺
- *End User – Nurse, happy patients*
- *Decision Maker – Hospital CEO, decrease 2-week Wait Time*
- *Payer – Hospital CFO, decrease MRI payback time & increase profits*
- *Any Influencers (Recommenders, Skeptics) – Technician, likes idle time between patients*

Customer Segment	Value Proposition	100% Solution
Kids/Parents (Beneficiary)	Better Imaging	No
Kids/Parents (Beneficiary)	Imaging w/ No Tears	Yes
Hospital CEO (Decision Maker/Payer)	Imaging w/ No Tears	No
Hospital CEO (Decision Maker/Payer)	Decrease MRI payback time & increase profits	Yes

Value *Propositions*
(Why Do They Care?)

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
		What *customer problems* are you helping to solve ?		
	Key Resources	**What *customer needs* are you satisfying?**	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**).

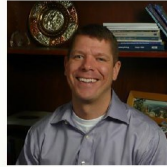http://conversionxl.com/value-proposition-examples-how-to-create/#.

28

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
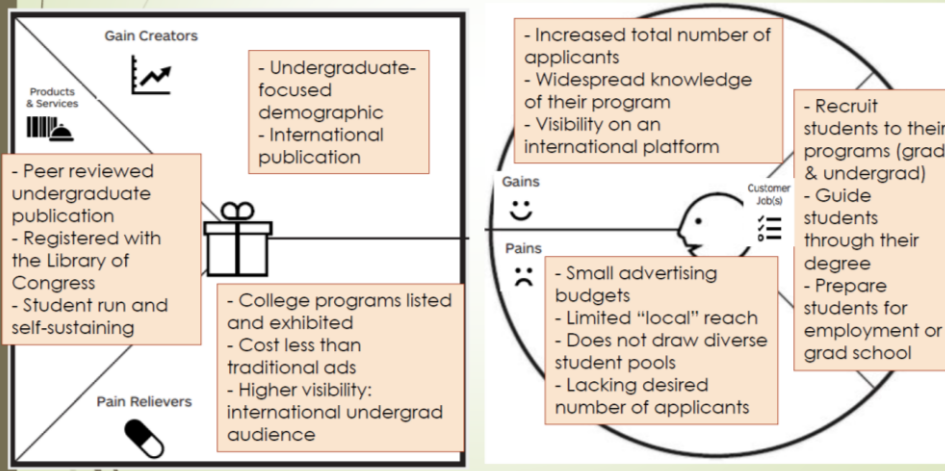*Principal Investigator*

Mark Combes
Mentor

Melissa Edwards
Mentor

Interview Count			
101	99	1	1

61: JUR Press

The Value Proposition Canvas

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

CS: University Department Chairs/Directors (Admissions)

Gain Creators

Products & Services

- Undergraduate-focused demographic
- International publication

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

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

Pain Relievers

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

Gains

Pains

Customer Job(s)

- 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

Features vs. Value Propositions

Features	Weak Value Propositions	Strong Value Propositions
Fun & Engaging	Faster, Cheaper, Better	Relevant, Significant & Testable Product Benefits
Field-specific skill building	Getting students involved in a Service Learning project	Increase number of females and minorities in Manufacturing Tech program

Customer Segments

Not Customer Segments	Vague Customer Segments	Clear Customer Segments
Buildings, Organizations	Broad Groups of People	Very Specific Job Titles, Very Specific Archetypes/Personas
Colleges	Faculty	Newly Hired, STEM Faculty

Customer Segments (CS) and Value Propositions (VP) Alignment

What makes for a compelling value proposition?

- o What problem are you solving/need are you serving?
- o How?
- o For whom?

Value Proposition Customer Segment Ad Lib

1. Individually
   a. Describe your innovation in 1-2 sentences
   b. Identify one VP for one CS
   c. Complete the ad lib template

Value Proposition Customer Segment Ad Lib

CS {
_____

Customer Segment: Which people? Be specific!

would "pay" to _____

Value Proposition: Solve this problem

VP {
in a way that

_____

Verb (reduces, increases, etc.)

_____

a specific Customer Pain or Gain

(unlike _____)

Extra Credit: How is it different from the competition?

CS Roles & Unique VPs: Your Project Matrix

1. Individually
   a. Describe your innovation in 1-2 sentences
2. Work with your partner to
   a. Complete your project matrix
   b. Specify your customer segments and their value propositions
   c. Discuss and fine tune your project matrix
3. Share with whole group

CS Roles & Unique VPs:
Your Project Matrix

Innovation: _____
_____
_____

Customer Segment Roles	Specific Customer Segments	Value Proposition
Beneficiary		
End User		
Decision Maker		
Payer		
Influencer Recommender Skeptic		

Customer Discovery: Interview Skills

Based on Merton, Fiske, & Kendall (1990).
The Focused Interview

Customer Discovery: Interview Skills

Important research tool

No superficial answers or **"Thin description"**
More than superficial understanding

"Rich data" "Thick description"
You need deep understanding of customer/users
Deep understanding of the meanings
 they make of experiences

The Focused Interview

YOU: What is the situation?
- You know something about the situation
- You have questions based on content/situation analysis

THEM: What are their situations?
- Your interviewee is familiar with her/his particular situation
- The interview is focused on the his/her experiences of the situation
- Get detailed descriptions—not general statements
- Get their perceptions/definitions of the situation

ANALYZE
- Look for patterns of subjective perceptions/definitions

The Focused Interview

The customer's context:
prior experiences,   personal attributes,   personal meanings of the situation

- **Range**—maximize anticipated and unanticipated responses

- **Specificity**—get highly specific reports

- **Depth**—obtain cognitive, affective, evaluative, and degree of involvement

The Focused Interview

Do
- Give them freedom to respond as they see fit
- Help them go back into a situation
- Get to know them
- Stay open to unanticipated responses
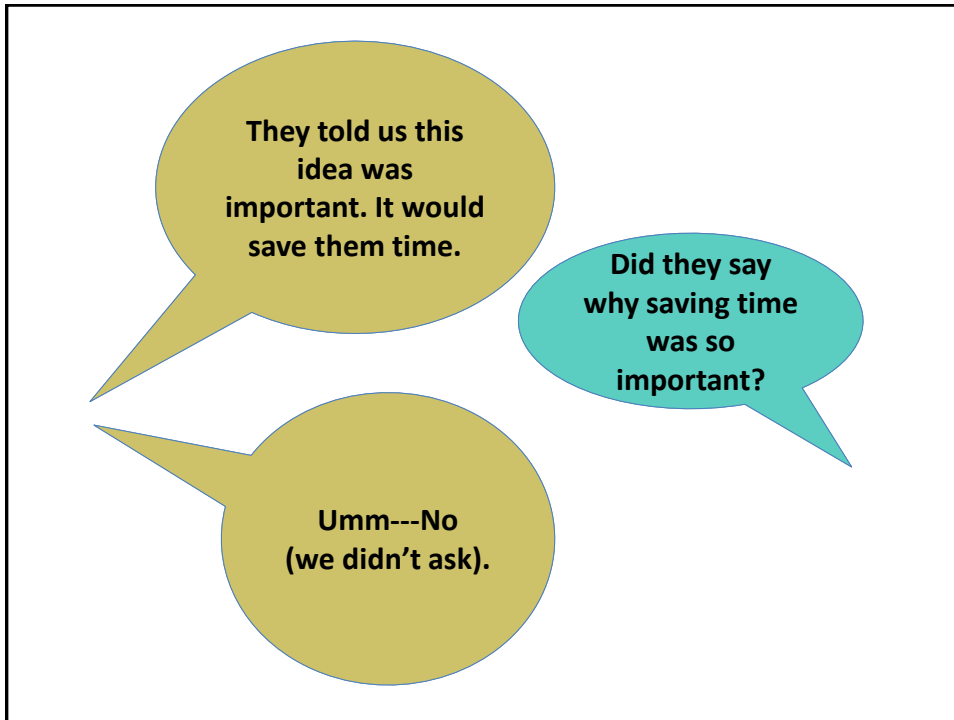- Why? Why? Why? Why? Why?

Do not
- Settle for superficial responses
- Value reflections, speculations, suggestions, or judgments
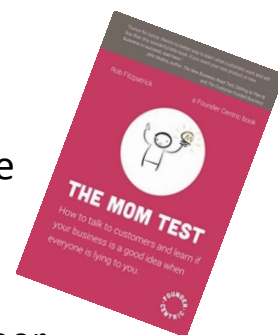- Rigidly stick to your interview questions

Customer Discovery: Interview Skills

Useful Interviews

Poor customer interviews are worse than useless—they are dangerous

The measure of usefulness is whether we have learned concrete facts about our customers' lives and their worldviews

Useful Interviews

Three recommendations:

1. Talk about their life instead of your idea
2. Ask about specifics in the past instead of judgments, reflections, or opinions about the future
3. Talk less and listen more

Bad data

- Compliments
- Fluff
- Ideas

The Mom Test Quiz

Good question, bad question

© Can Stock Photo

Would this be a good idea?

Would you buy a product that did this?

How much would you pay for it?

The Mom Test Quiz

Good question, bad question

Why do you bother?

What would your dream product do?

What are the implications of that?

© Can Stock Photo

The Mom Test Quiz

Good question, bad question

What else have you tried?

Talk me through the last time that happened?

How are you dealing with this situation now?

© Can Stock Photo

The Mom Test Quiz

Good question, bad question

Who else should I talk to?

© Can Stock Photo

Where does the money come from?

Is there anything else I should have asked?

Useful Interviews: Good Questions

Dig deep (*go beyond the superficial answers*)

Get good data (*not speculation or opinions*)

Get into the mindset (*empathy and discovery*)

Stay focused (*understand, but don't blindly follow every idea or request*)

Obstacles and Distractions

People don't want to hurt your feelings

"Give me the honest truth—I can take it."

Keep focused on the other person—NOT YOU or the IDEA.

Don't pitch or sell.

Obstacles and Distractions

Look for bad news—it's an early warning signal.

Avoid "false positives."

Don't jump to conclusions—keep digging.

Look for strong signals. Example of librarians and STEM books for kids

Customer Segment and Value Proposition Alignment

Kick-off – Class 1

Wrap-up – Class 10

STEM-Packs

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

Value Propositik	Customer Segn
Library survival/growth	PreK-8 SRC Children's
School Districts - continuous STEM	Library Directors
★STEM-Pack (all parts)	★Educators
	★Family Members

124 Interviews →

Story Time STEM Packs

Integrating science, math, and engineering activities with children's literature

Value Propositik	Customer Segn
Increase SRC & other library	Library Directors
Increase comfort level with	Librarians without
Assure standards-based	Librarians with Educators/STEM
Decrease activity	Part-time and small libraries
Increase entry into STEM-	Library Donors/Decision

Value Propositions

Decrease activity preparation time to 20 minutes or less

Customer Segme

Part-time and small library staff

STORyTIME STEM-PACKS

What is your Research Strategy?

- **Who?** *Talk to the right people*

- **How?** *Ask the right questions*

- **What?** *Learn what they do*

10/23/2017

Ready, Fire, Aim

Think for a minute about a good question to kick off an interview

Ready, Fire, Aim

Pair up and develop an interview guide

1. Opening question
2. Learning question
3. Deeper learning question
4. Closing question

Then
Practice, practice, practice

Next Steps

- **Reflect on your engineering education innovation**
- **Jot down**
  - What do you plan to do next?
  - What are your longer range plans?
- **Continue the conversation during the FIE conference and beyond**
  - EER&I Networks – CLEERhub, REEN, SEFI, National Innovation Network (NIN), NSEC
  - Meet again at the ASEE Conference, June, 2018
- **Please complete a survey** -

  https://www.surveymonkey.com/r/SmartStartFIE17

Acknowledgments

Thank you!

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

http://personal.cege.umn.edu/~smith/links.html

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