



# 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

## **Introduction of Session and Facilitators**

**5 min**

## **Brief introduction to the I-Corps™ for Learning Program**

**10 min**

- History
- Goals
- Current Initiatives

## **Lean Start-Up Approach**

**25 min**

- Business Model Canvas
- Customer Discovery Process
- Agile Engineering – Iterate & Increment

## **Customer Segments (CS) and Value Proposition (VP) Exercise**

**30 min**

- Identify an education innovation that you would like to see sustained and scaled
- Within that innovation identify one Value Proposition (VP) that you think is aligned with one Customer Segment (CS)

## **Summary and Feedback**

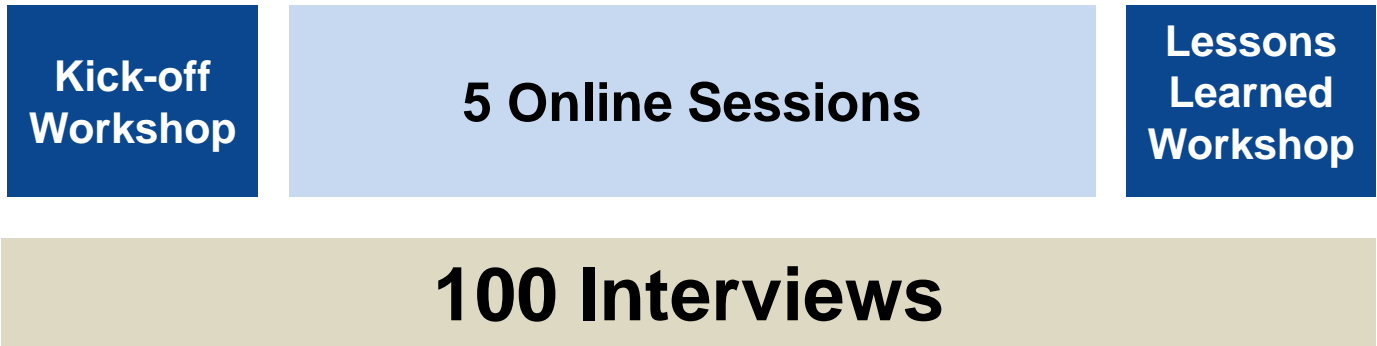
**10 min**

# 7-week Program

**Educational  
Innovation**



**Customer  
Discovery**



**Readiness for  
Sustaining  
& Scaling?**




# I-Corps™ for Learning History


June  
2013


June  
2014


June  
2015

June  
2016

 Pilot: Jan-Feb 2014

 Cohort 1: Jan-Feb 2014

 Cohort 2: Jul-Aug 2015

 Cohort 3: Jul-Aug 2016

**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

Team Name _____ Team # _____	TEAM DECISION	Go	No Go, But Continue	No Go
	TTREC	Go	No Go, But Continue	No Go
	Evidence of Criteria in Team's BMC			
Teaching Team criteria for a 'Go' decision:	None (1)	Poor (2)	Adequate (3)	Outstanding (4)
1. Value propositions align with customer segments				
2. Evidence of champion (decision-maker) from at least one customer segment				
3. Specific and concrete definition of scale				
4. Credible path towards scaling and sustaining identified				



# Participant/Alumni Segments

**Current  
Profession  
Leaning  
(36%)**



**PURDUE**  
UNIVERSITY

**Entrepreneur  
Leaning  
(20%)**



VITAL

**Both  
(44%)**



 SAINT LOUIS  
UNIVERSITY

VITAL

# 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

## The Team



Jenna Gorlewicz  
Founder and President

in



Corrine Mueller  
Vice President of Business

in



Jeff Crossell  
Vice President of Software  
Development

in



Justin Vartanian  
Software Developer

in



Jen Tennison  
Research Assistant

in

## Our Technology

Leveraging commercially available tablets

### Create



Automatically transform existing lessons into accessible content. Easily create and customize new teaching materials.

### Engage



Real-time display in class promotes inclusion and peer-to-peer interactions with diverse learning styles.

### Learn



Personalized content enables learning through **sight**: contrast and zoom, **sound**: dictation, and **touch**: tactile graphics.

### Collaborate



Integrate, share and sync with digital classroom tools (Google apps, LMS, and Apple for Education).



CENTER FOR TRANSLATION OF REHABILITATION  
ENGINEERING ADVANCES AND TECHNOLOGY

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

**The Lean Startup In Three Steps**



# 1. Frame Hypotheses

□ Frame Hypotheses

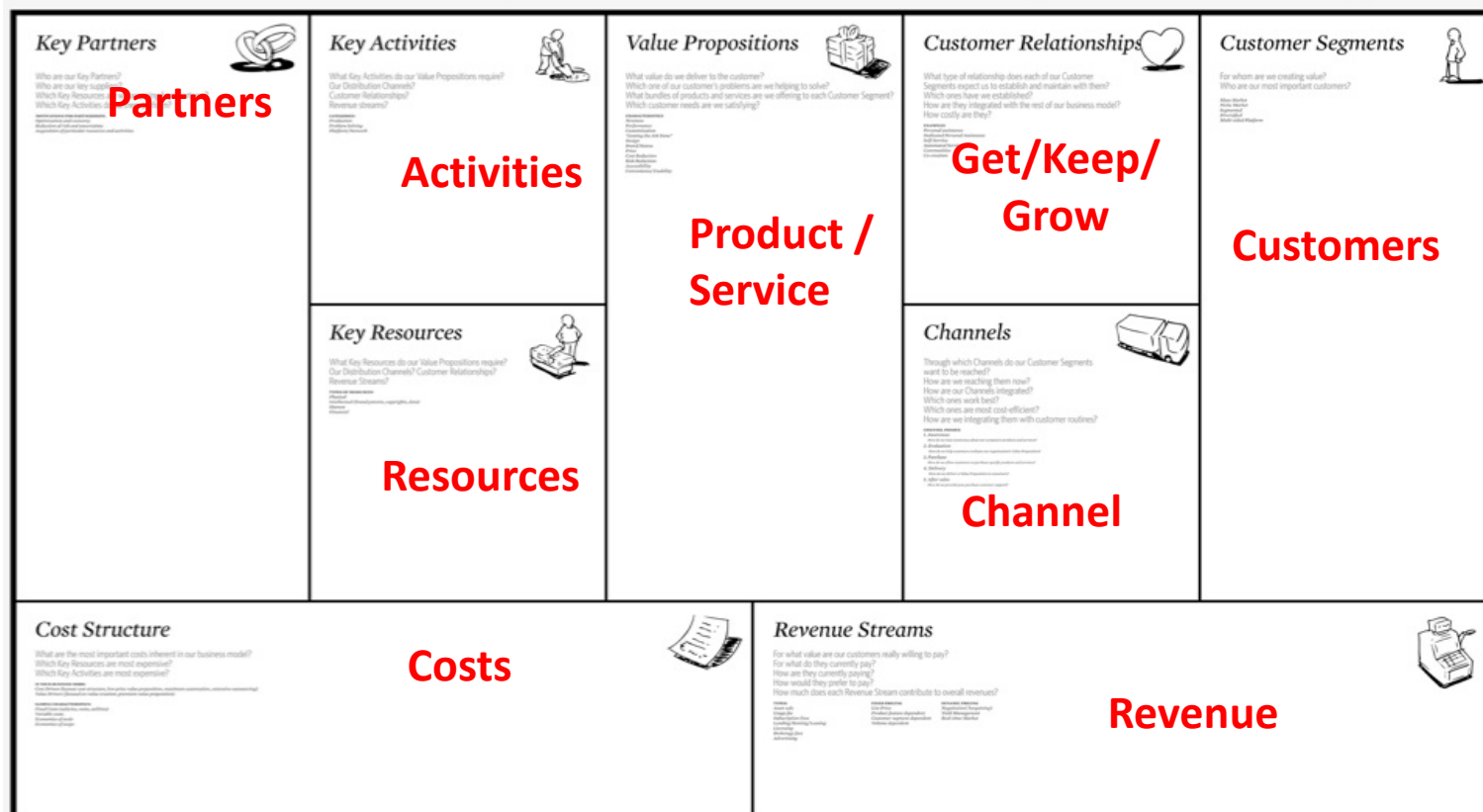


# 1. Frame Hypotheses

□ Frame Hypotheses



Business Model Canvas

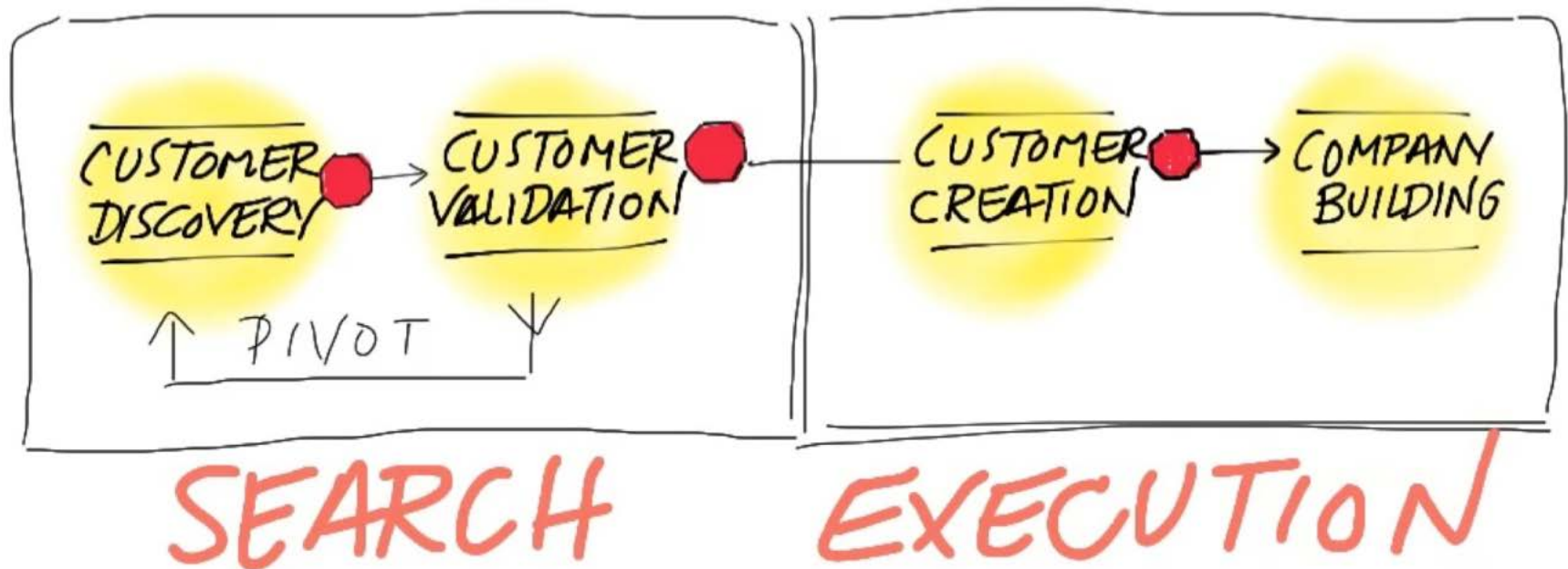


## 2. Test Hypotheses

- Frame Hypotheses → Business Model Canvas
- **Test Hypotheses** →

# 2. Test Hypotheses

- Frame Hypotheses → Business Model Canvas
- Test Hypotheses → **Customer Discovery**



## 2. 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



**Nathaniel Stern**  
*Entrepreneurial Lead*



**Ilya Avdeev**  
*Academic Lead*



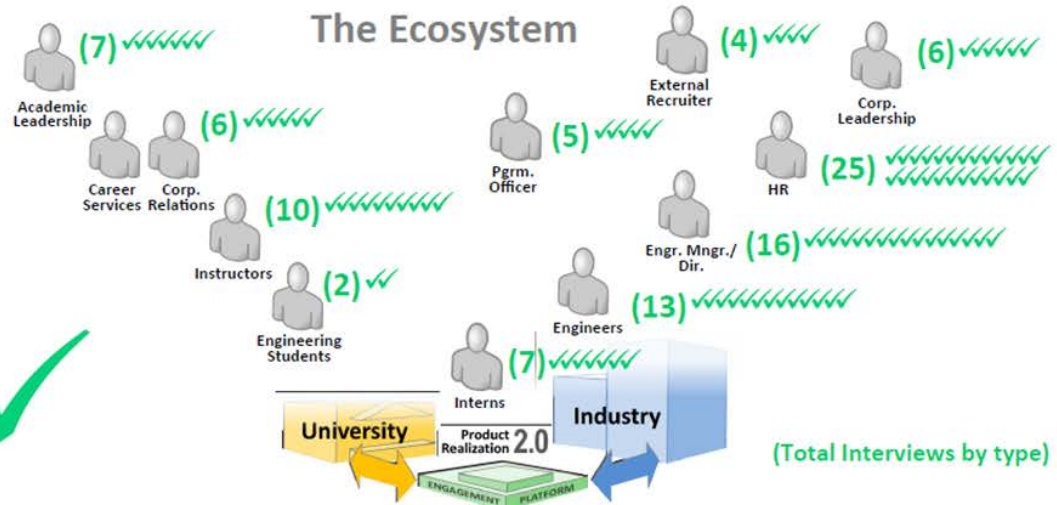
**Brian Thompson**  
*Mentor*

### INTERVIEWS

	New	Total
	7	78
	-	10
	1	13
	<b>8</b>	<b>101</b>



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



# 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



# The Lean Startup

**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**

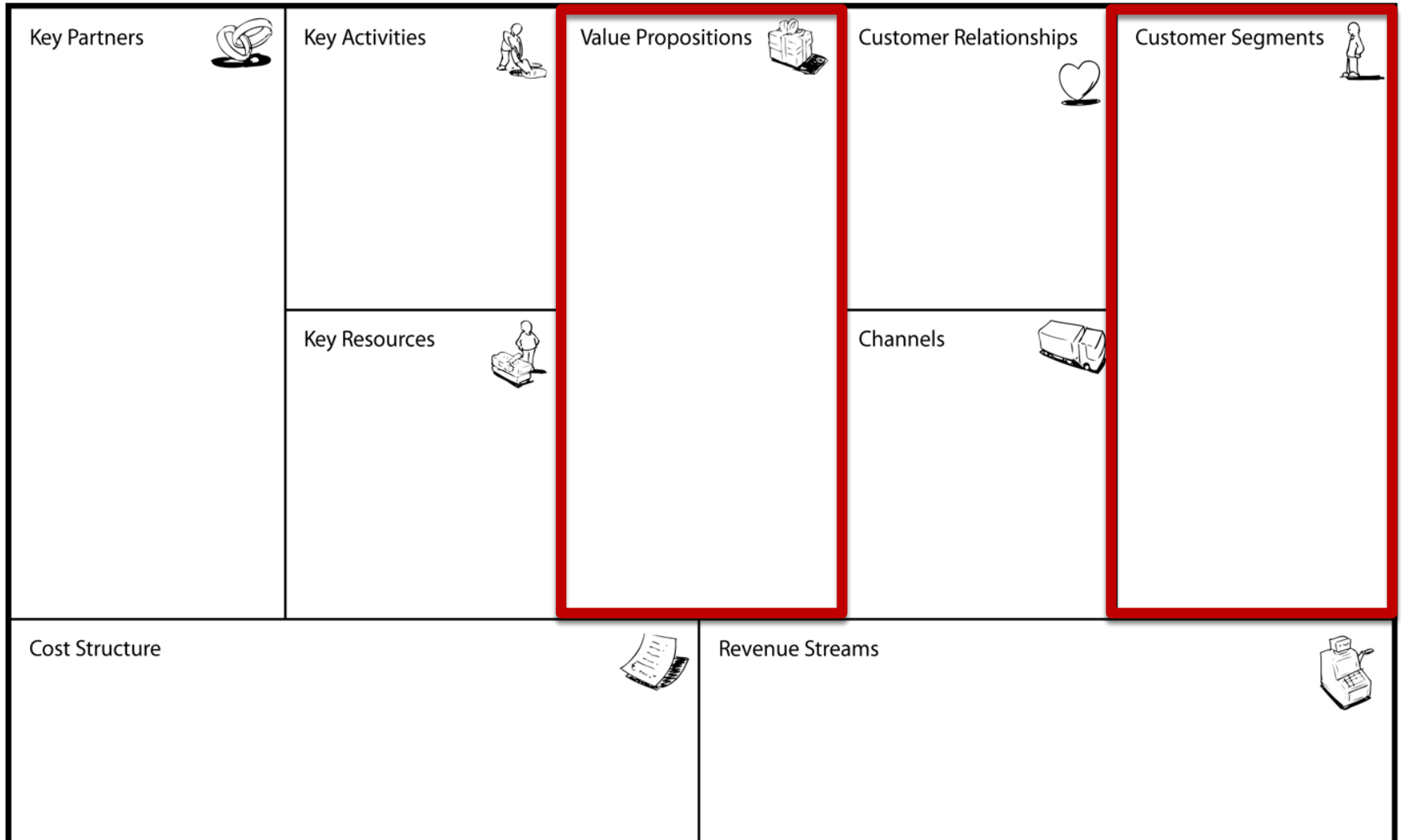
**2012 Total Revenue: \$15M**

- Almost all from donations
- \$500,000 fees for services

**BILL & MELINDA**  
*GATES foundation*

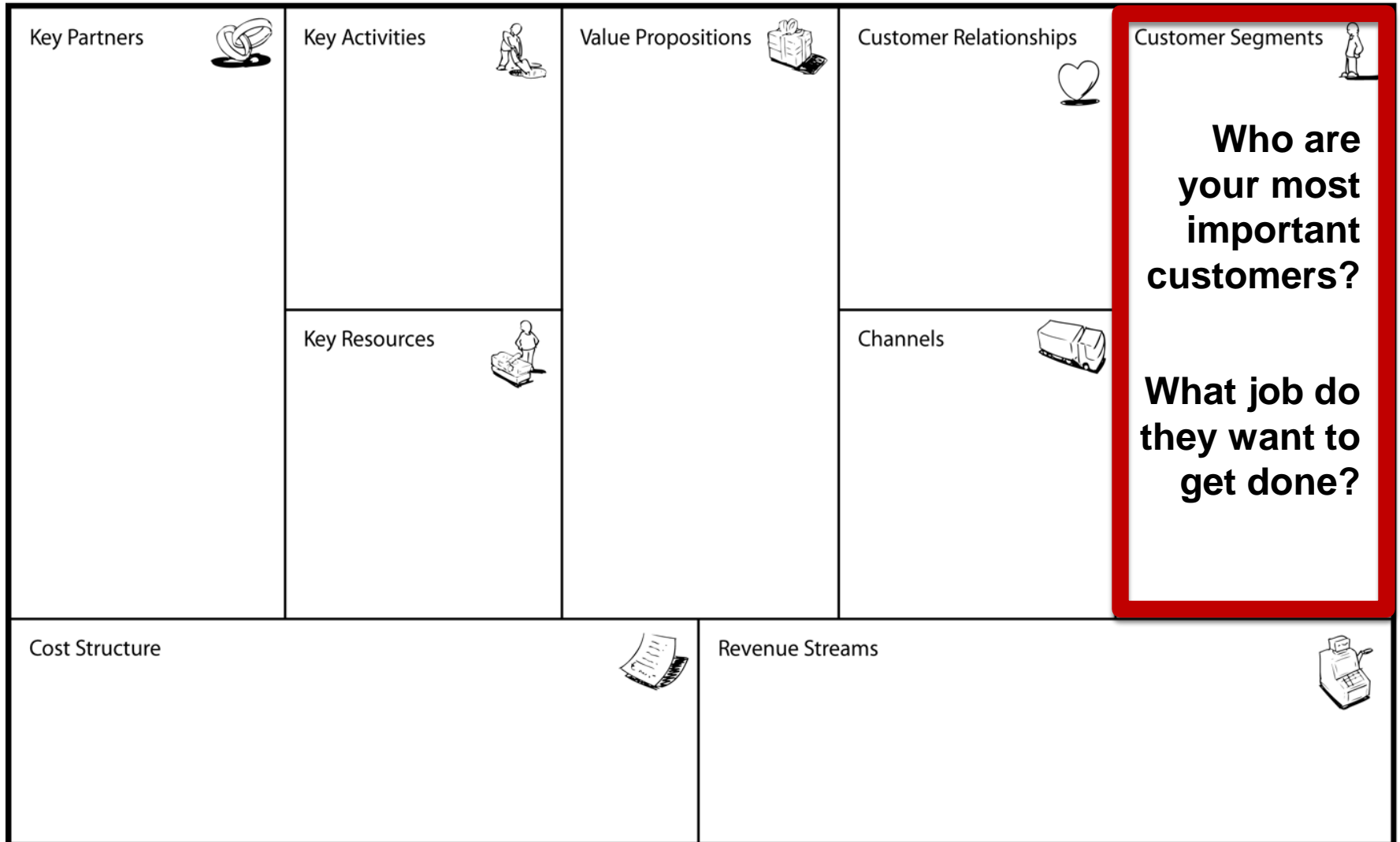
- 
- **Non-profit doesn't mean you shouldn't charge for the value you deliver!**
  - In fact, it's imperative that you do figure out **what you can charge for** and **who will pay** (other than students & teachers).

# That's why we start with *these*



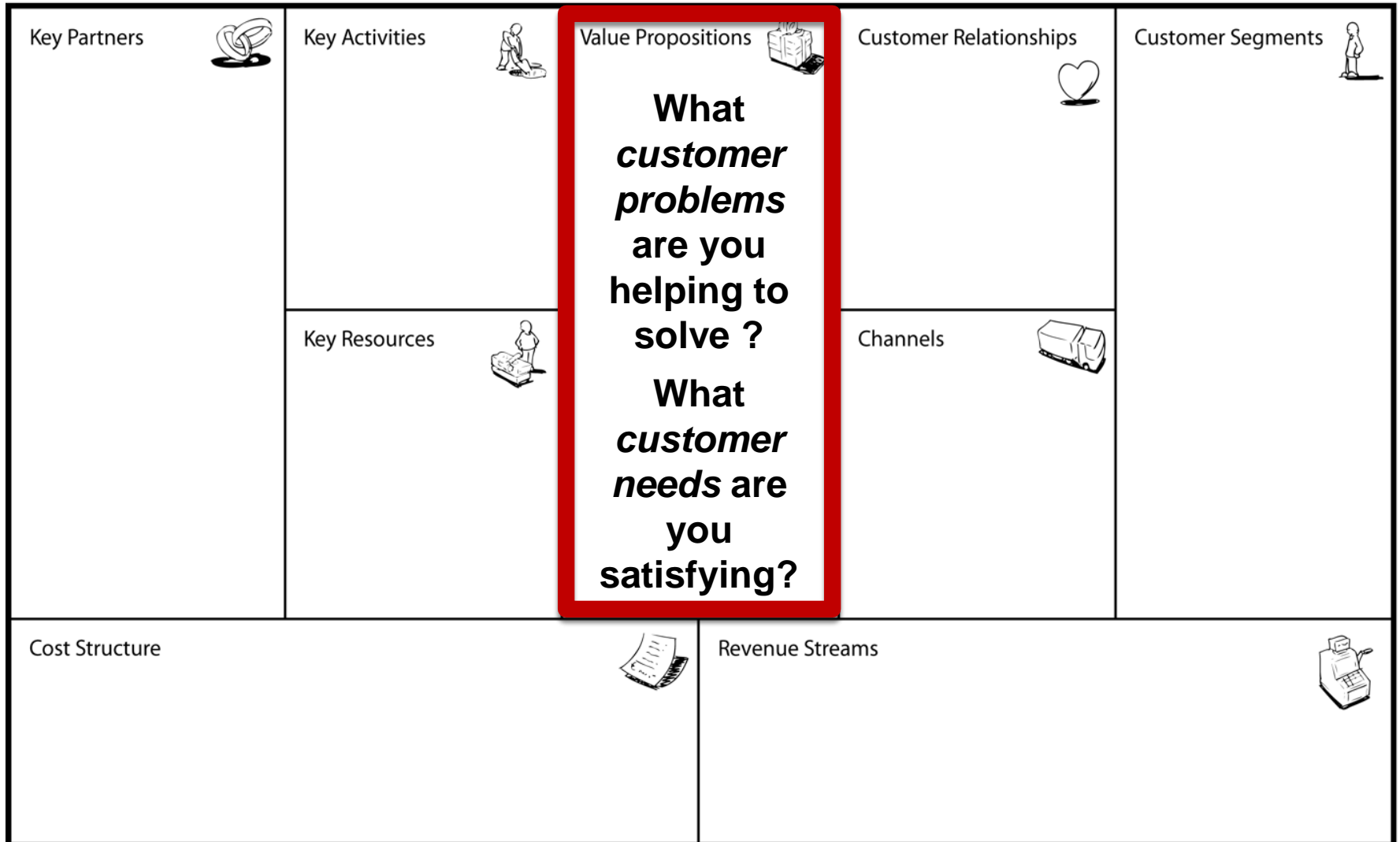
# Customer Segments

*(Does Anyone Care?)*



# Value Propositions

(Why Do They Care?)



# TOP 10

## STARTUP MISTAKES

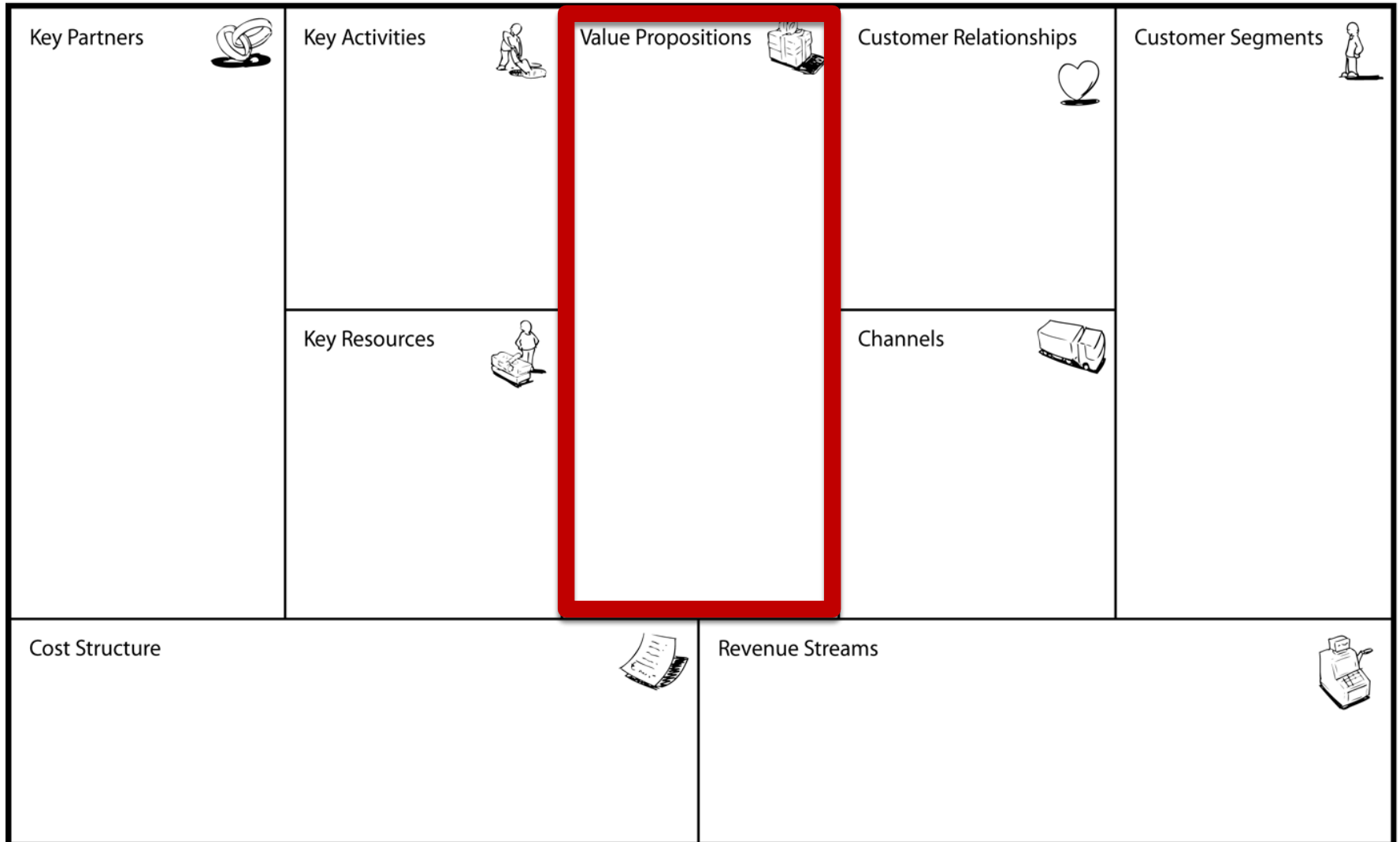
**Mistake #1**

**Building  
Something  
Nobody  
Wants!**



# Value Propositions

(Why Do They Care?)





# 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

**Features**

**Weak Value Propositions**

**Strong Value Propositions**

Fun &  
Engaging

Faster,  
Cheaper,  
Better

Relevant, Significant &  
Testable Product  
Benefits

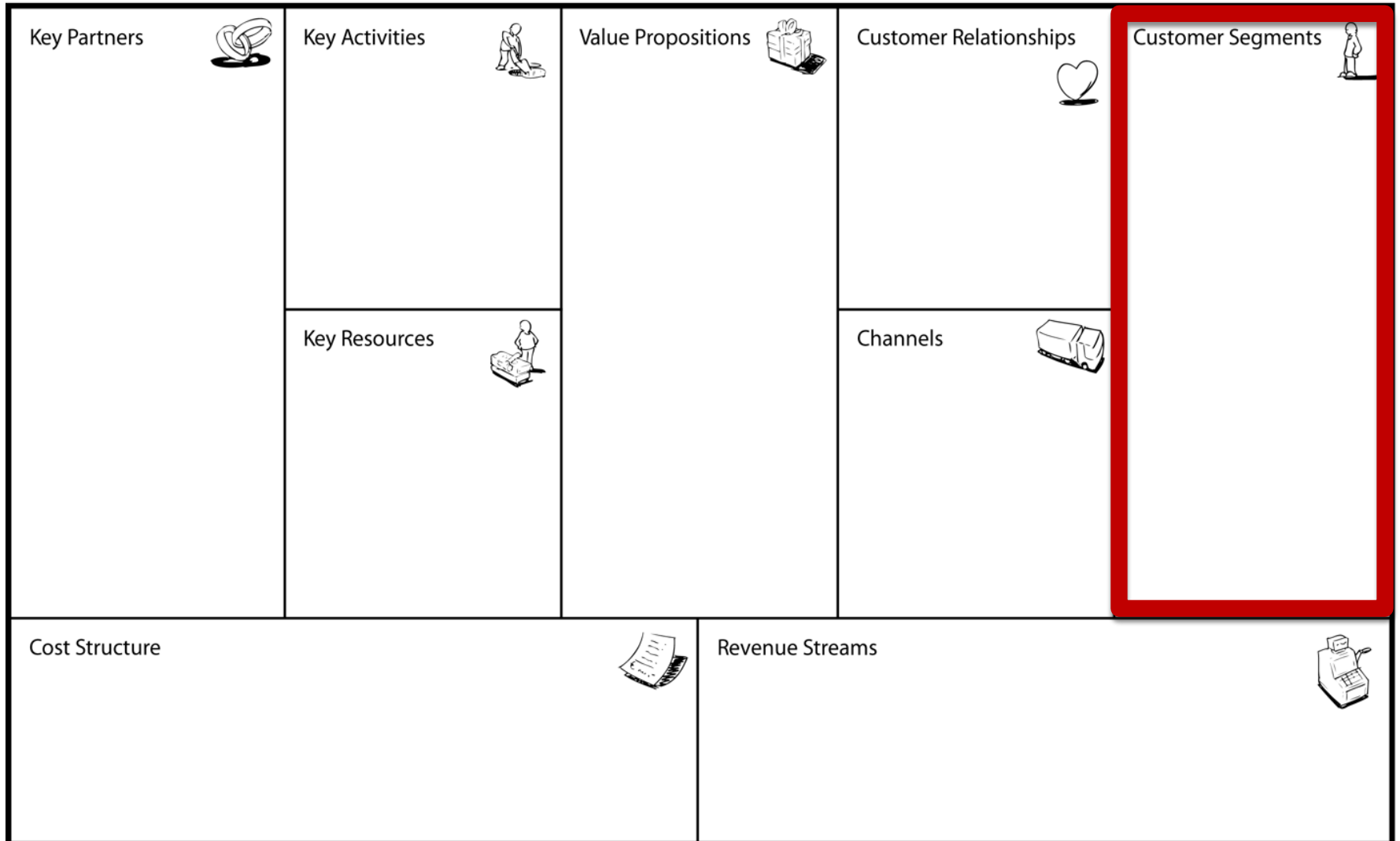
Field-specific skill  
building

Getting students  
involved with an  
undergraduate  
publication

Increase number of  
good applicants for  
graduate schools

# Customer Segments

*(Does Anyone Care?)*



# Customer Segments

## Not Customer Segments

Buildings,  
Organizations

Colleges

## Vague Customer Segments

Broad Groups of  
People

Faculty

## Clear Customer Segments

Very Specific Job  
Titles, Very Specific  
Archetypes/Personas

Newly Hired, Tenure-  
track Engineering  
Faculty

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

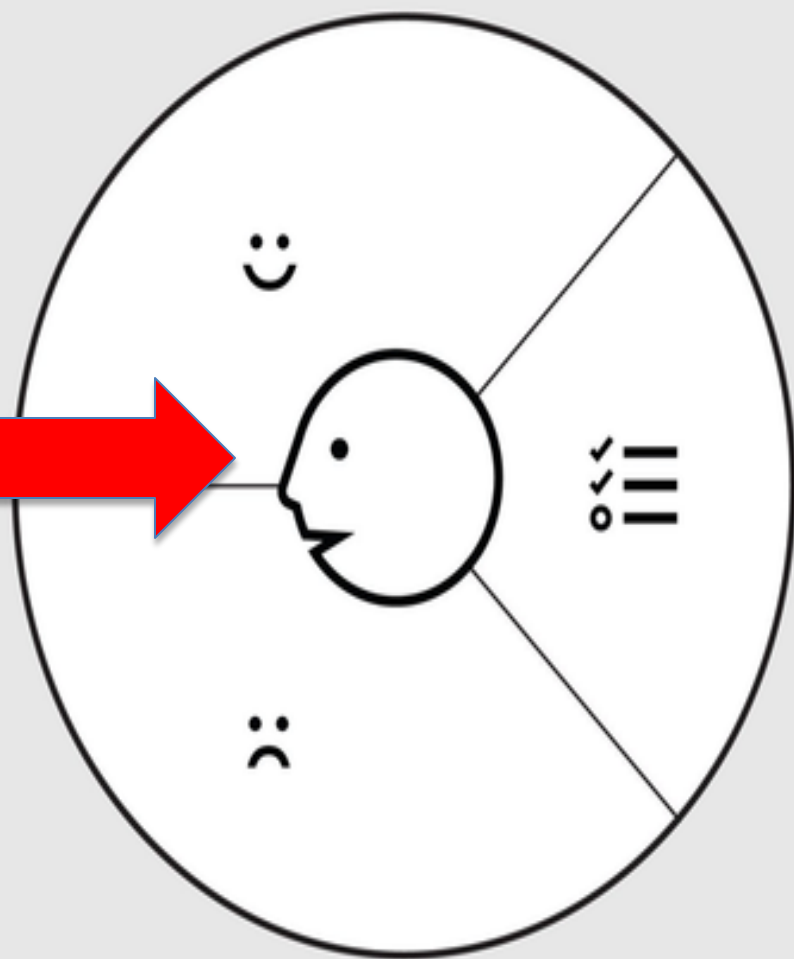
## What makes for a compelling value proposition?

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

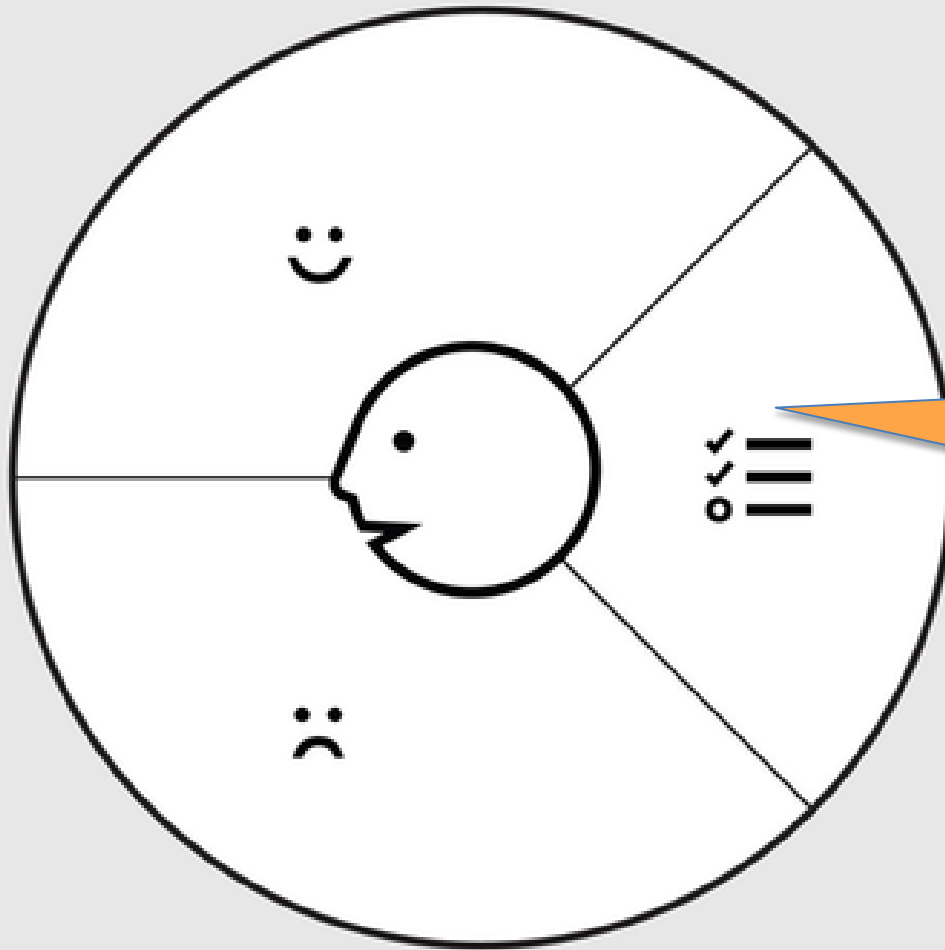
## The Value Map



## Customer Profile



# Customer Profile



**Customer Jobs:  
What do they  
have to do and  
how do they do it  
now?**

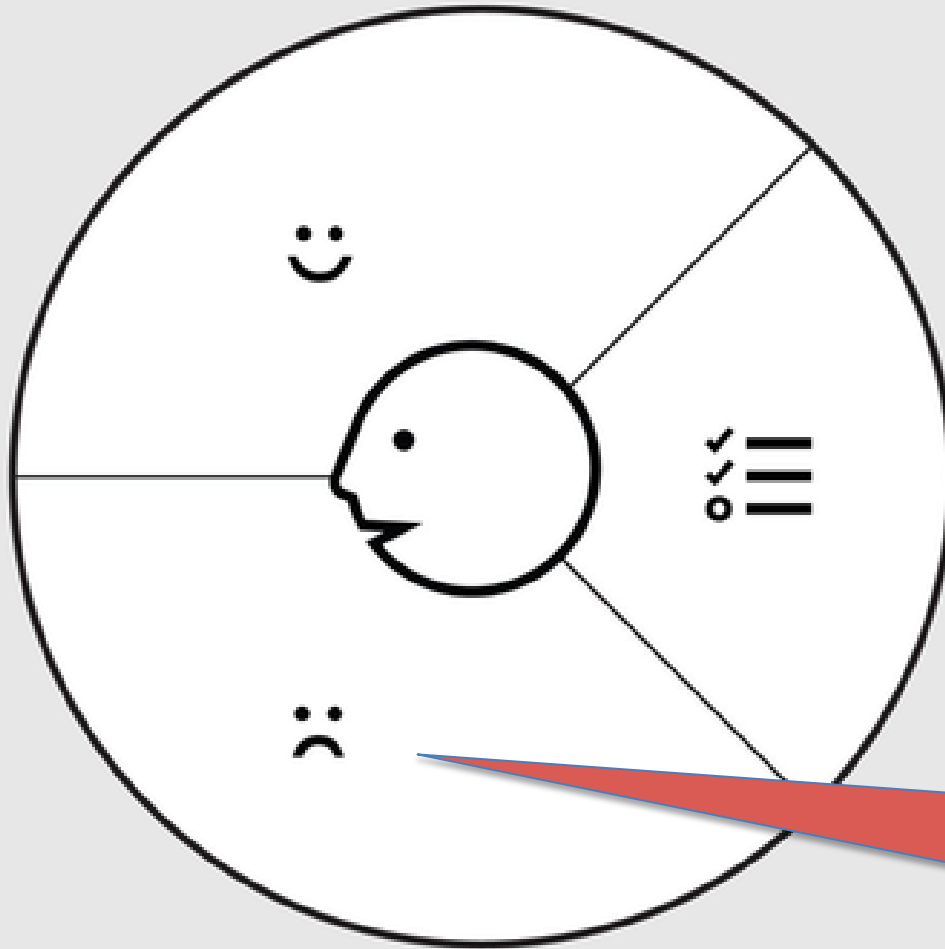
## Jobs

- Functional
- Social
- Emotional
- Supporting

Job's contexts

Job's importance

# Customer Profile



## Pains

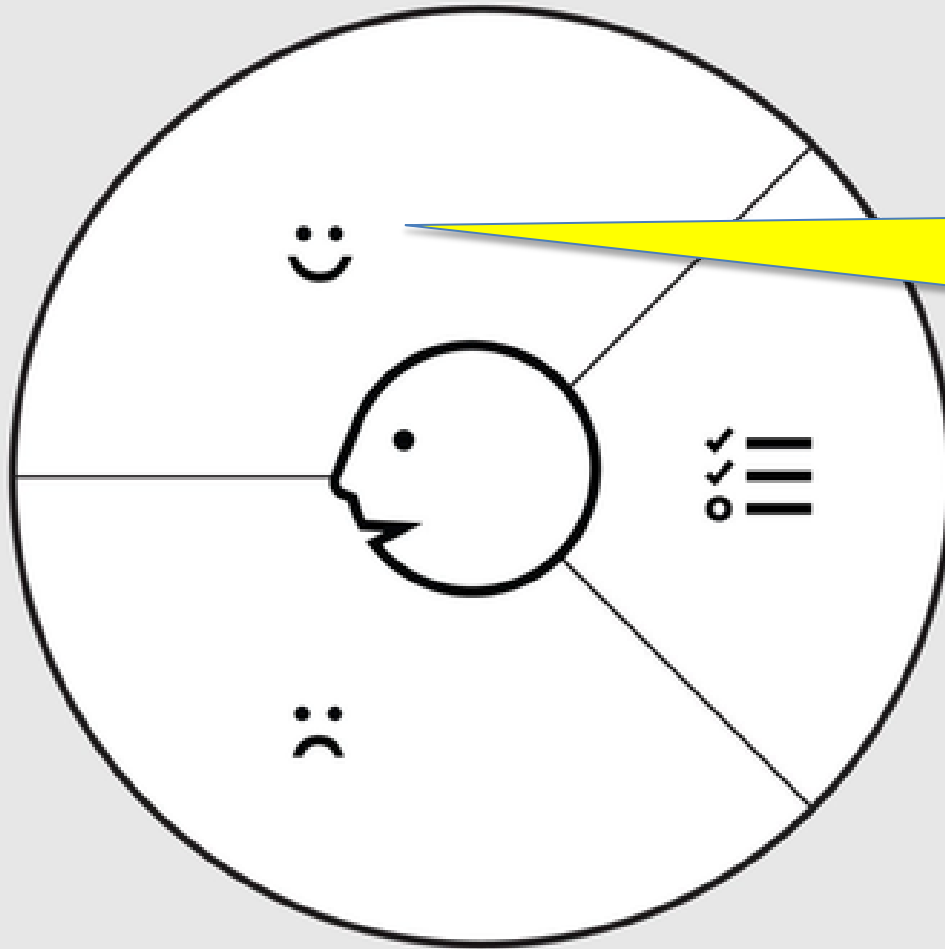
- Undesired outcomes
- Obstacles
- Risks
- Difficulties

## Severity

**Customer Pains:  
What annoys  
your customers?**



# Customer Profile



**Customer Gains:  
What do they  
want?**

## Gains

- Functional
- Social
- Emotional
- Resourceful

## Relevance

- Required
- Desired
- Expected
- Unexpected

# The Value Map

**Products & Services:  
What are you  
offering?**

Products & Services

- Physical, tangible
- Intangible

Relevance



# The Value Map

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



Gains Creators

- Expectations
- Desires
- Utility
- Unexpected

Relevance

# The Value Map

## Pain Relievers

- Undesired outcomes
- Obstacles
- Risks
- Difficulties

## Relevance



**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

**VP**

in a way that

\_\_\_\_\_  
Verb (reduces, increases, etc.)

\_\_\_\_\_  
a specific Customer Pain or Gain

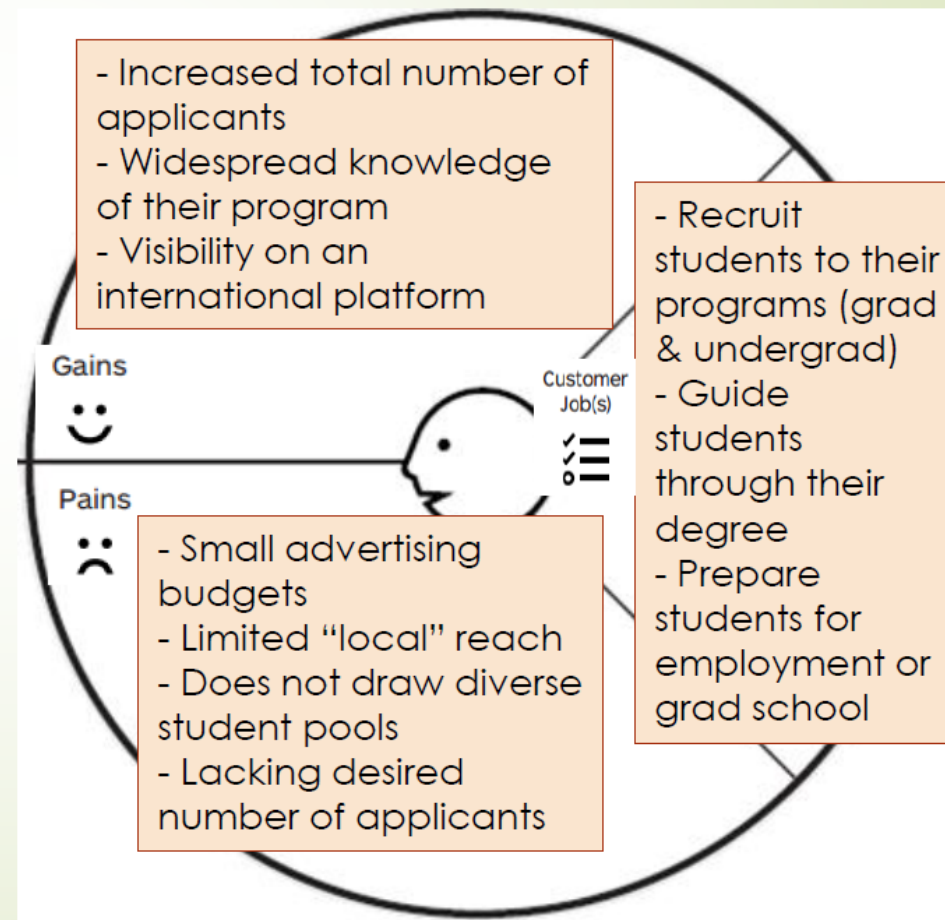
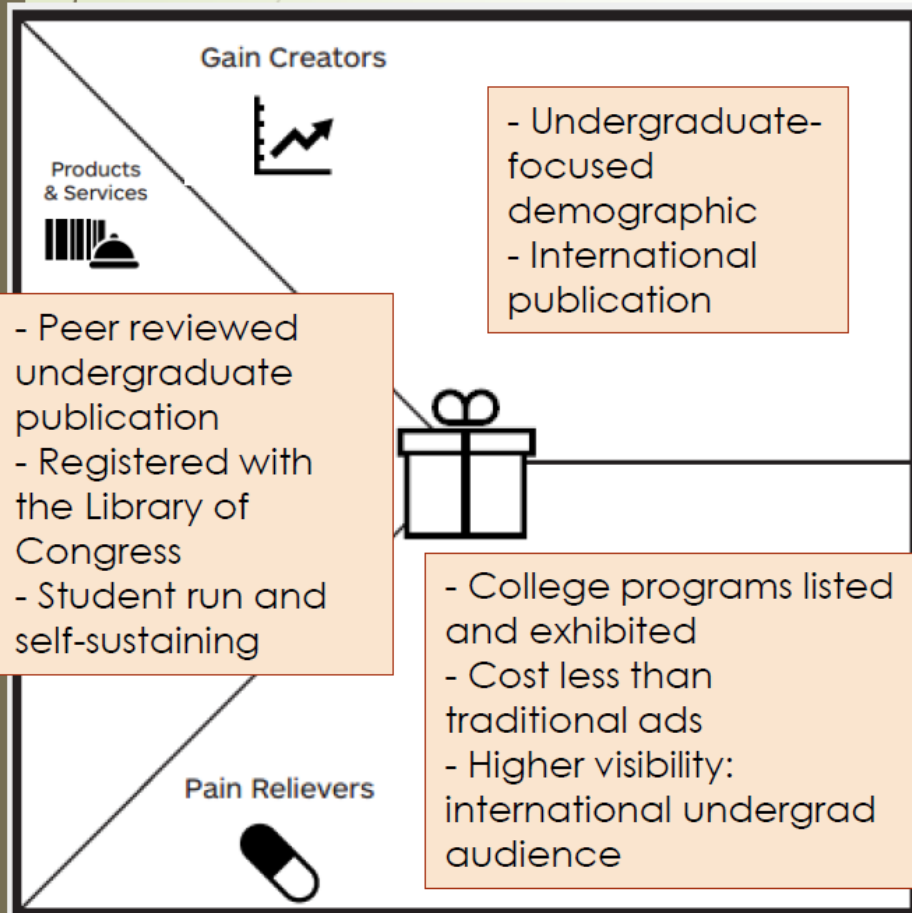
(unlike \_\_\_\_\_)

Extra Credit: How is it different than the competition?

# The Value Proposition Canvas

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

**CS:** University Department Chairs/Directors (Admissions)



# Customer Segment and Value Proposition Alignment

## Kick-off – Class 1

<b>STEM-Packs</b>  Introducing modular, standards-based, PreK-8 STEM learning into public library Summer Reading Club by connecting literature with STEM activities	<b>Value Proposition</b>	<b>Customer Segn</b>
	Library survival/growth	PreK-8 SRC Children's
	School Districts - continuous STEM	Library Directors
	★STEM-Pack (all parts)	★Educators
		★Family Members

124 Interviews

## Wrap-up – Class 10

<b>Story Time STEM Packs</b>  Integrating science, math, and engineering activities with children's literature	<b>Value Proposition</b>	<b>Customer Segn</b>
	✔ 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 Segments

Part-time and small library staff

# 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

Awareness Sessions	Introduction to I-Corps™ L	National Cohort
1-3 hours	2 weeks	7 weeks
Face-to-Face Online	Online Hybrid	Hybrid
<ul style="list-style-type: none"> <li>• Introduction to core features of the Lean Startup Process</li> <li>• Focus on the importance of sustainable scalability at the early stages of concept development</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity to develop ‘proof-of-concept’ evidence towards sustaining and scaling</li> <li>• Focus on Value Proposition + Customer Segment ‘fit’</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity to determine innovation readiness for sustainable scalability</li> <li>• Immersion in the Lean Startup Process</li> </ul>
<b>Frontiers in Education (FIE)</b> October 12-15, Erie, PA	<b>*ASEE Annual Conference</b> June 25-28, Columbus, OH	? (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



**WE WANT YOU!**

<https://www.asee.org/i-corps-l/>

# Thank you!

An e-copy of this presentation will be posted to:

[www.asee.org/i-corps-I](http://www.asee.org/i-corps-I)

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