Marine Advanced Technology Education (MATE) Center’s
I-Corps L Experience

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Marine Advanced Technology Education (MATE) Center

- MATE’s mission is to use marine technology to create interest in and **improve science and technology education** and to provide the marine technical workforce with **well-educated technical professionals**.

- MATE Center founded in 1997, based in Monterey, CA.

- Funded in part by the NSF (ATE/ITEST/REU), industry contributions, and SeaMATE store sales.
We need a reliable source of income that will grow as we grow!
SeaMATE is a social enterprise that provides community college students with workplace experience while creating products and services which promote engineering and technology education.
MATE ROV Competitions

- 2015 marks 15 years of competition activities
- 13 countries competed in 2015
- 27 Regional Competitions in 2016

![Graph showing team participation from 2001 to 2013](image)
We have developed products without going through the customer discovery process.

- Developed and self published a textbook.
- Excellent reviews!
- 100s of beautiful color photographs and diagrams.
- 780 pages.
- Weighs 6 pounds!
NSF Innovation-Corps L

- Challenge NSF education researchers to think beyond their research results and toward broader adoption of STEM education and learning innovations.

- $50,000 for 6 months

- PI, Entrepreneur, Mentor [team of 4]

- Attend course: *Lean Startups and Evidence-Based Entrepreneurship* January – February 2015

- Interview 100 potential customers [106]
Very, Very, Time Consuming!
And you need thick skin!
Initial Innovation:
Underwater Robotic Kits, Lab Materials and a Lesson and Activity Book aligned with NGSS

UW Robotic Kits + Lab Materials + Lesson and Activity Book
Customer Segments:

We are helping...

- Educators
- Parents
- School administrators

Our customers need help with:

- Motivating students
- Finding a ready-made curriculum package
- Professional development
- Affordable one-stop shop
# Customer Archetypes

<table>
<thead>
<tr>
<th>ATTRIBUTE</th>
<th>DON</th>
<th>EMILY</th>
<th>KELLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td><strong>Volunteers time.</strong> Enhance STEM skills and project/team management skills. College entry, scholarships.</td>
<td><strong>Self-motivated</strong> to engage students in hands-on, project-based learning emphasizing engineering, other STEM, and 21st century skills aligned with standards.</td>
<td><strong>Required to</strong> teach engineering skills as part of instructional program.</td>
</tr>
<tr>
<td>Goal</td>
<td>Win competition</td>
<td>Merge academic and <strong>real world</strong> engineering experiences so students can think, solve problems, have fun and learn.</td>
<td>Prepare students to meet instructional goals and pass assessments.</td>
</tr>
<tr>
<td>Resources</td>
<td>Generally has engineering/technical skills and pool access but may be <strong>interested in convenient PD.</strong></td>
<td><strong>Seeks and acquires training and support for any gaps in skills needed to be successful.</strong> <strong>Develops own curriculum!</strong></td>
<td>Needs detailed guidance, PD and curriculum.</td>
</tr>
<tr>
<td>Budget</td>
<td>$500 - $5000/ROV</td>
<td><strong>Able to work the system</strong> to get level of funding they need. Average ~ <strong>$2,000</strong> (From District or Grants)</td>
<td>Work with budget provided by the principal/administration.</td>
</tr>
</tbody>
</table>
Value Propositions (1/2 of them)

Parents:
- Addressing **fears** that their children are not being taught **STEM concepts** in their formal education program that they believe are critical to future success.
- Getting experiences that can lead to **scholarships, internships and college entry**.

Teachers:
- Teaching STEM subjects in a way that **students want to keep doing it** during class and on their own time. (**PASSION**)  
- Offering experiences that tie academics to **real-world problems** and the workplace.  
- Enhancing professional development and earning **formal recognition** through certification.  
- Making it easy to find and **purchase** materials.
Summary of PD Survey Results

1. More that 50% of the teachers are **required** to participate in PD, many have a budget for off-site PD.

2. 77% **pay** for their own PD.

3. Delivery format preference:
   - ✓ hybrid instruction (59%); in-person (29%) online (12%)

**Factors that are most important in PD:**
- A certificate that documents the course content and learning objectives - 80%
- A nationally recognized certificate - 78%
- A certificate linked to the Next Generation of Science Standards - 67%
- Graduate credit for the professional development - 60%
Market Size

22 million students in grades 5-12*
500,000 K-12 math & science teachers in the U.S.*
More than 500,000 students participate in robotics competitions.
And many more do a robotics activity.

If 5,000 (1%) of teachers participate in UW robotics and...

If the average sale of kits, lab resources, curriculum, and/or PD is $500...

Revenue Goal: 5,000 x $500 = $2,500,000

*Source: http://nces.ed.gov/
Distribution Channel Diagram

**Store**
- Kits, lab materials, books, loaner kits

**Customers:** Parents & Educators

**Professional Development:** in person, online, and hybrid instruction

**Channel Economics: “Direct” Sales & Instruction**

- Cost of Goods and/or Instruction
- Customer and Technical Support
- Profit + SG&A + R&D
- Shopify Transaction Fee ~ <$1.00
- List Price
- Course Price

Revenue = List Price + Course Price

- Shopify: Transaction Fee ~ <$1.00
- Direct Sales
- Dedicated E-Commerce
A “Living” Business Model Canvas

Customers

- STEM Educators
- Parents who want to enhance STEM education

Key Partners

- Employers
- Professional societies
- Educational & like-minded organizations

Key Activities

- Marketing (Building Awareness)
- Deliver Professional Development
- Purchase Supplies
- Customer Service and Tech Support
- Developing New Products
- Building Kits & Supplies
- Business Operations
- Operational Human Resources
- Inventory Management
- Production Space
- Suppliers

Key Resources

- Website and Customer Database
- Payment Management and Shipping
- MATE Brand
- Mentors and PD Instructors
- Customer-Facing Operations

External

Internal Operations
## We Analyzed our Competition

<table>
<thead>
<tr>
<th>Player</th>
<th>Cost</th>
<th>Real-world missions</th>
<th>Fosters creativity</th>
<th>Kits</th>
<th>Curric</th>
<th>P D</th>
<th>Unique attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST</td>
<td>$$$</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>• Scholarship program, internship program, and a network on LinkedIn</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Boeing uses FIRST for employee development</td>
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<tr>
<td>VEX</td>
<td>$$</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>• Approved by the NASSP</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Offers Technology Student Association-approved events</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Partnership with PLTW</td>
</tr>
<tr>
<td>SEA PERCH</td>
<td>$</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>• Teachers can apply for grants to purchase kits</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• SeaPerch is very tied to ONR</td>
</tr>
<tr>
<td>MATE</td>
<td>$</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>• Focus on entrepreneurship</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• “More of a collaboration than competition”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• We are nice people</td>
</tr>
</tbody>
</table>
What did we learn?

1. Our current customers are truly exceptional educators. To scale, we need to serve “normal” teachers who need more help and more professional development.

2. This project forced us to learn more about our competitor’s best practices, this gave us the confidence to start a dialog with them, and to consider forming strategic partnerships.

3. No one has money until they see something they really want!

4. How truly amazing it is to ask open-ended questions and to listen with no agenda.
Final Innovation:
Underwater Robotic Kits, Compliment of Resources, and Professional Development

Pivot

UW Robotic Kits + Compliment of Resources + Nationally recognized PD

Team 19
What do I recommend before you apply for an I-Corps L grant?

- Have a customer base that you can call upon to interview for half of the interviews.
- Have some type of product or service that people are actually using.
- Have 2 months where you can set most of your work aside.
- And if you are accepted... bring Valium.