

Teaching Assistant Coaches and Campus Collaboration

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**STANFORD
PRODUCT
REALIZATION
LAB**

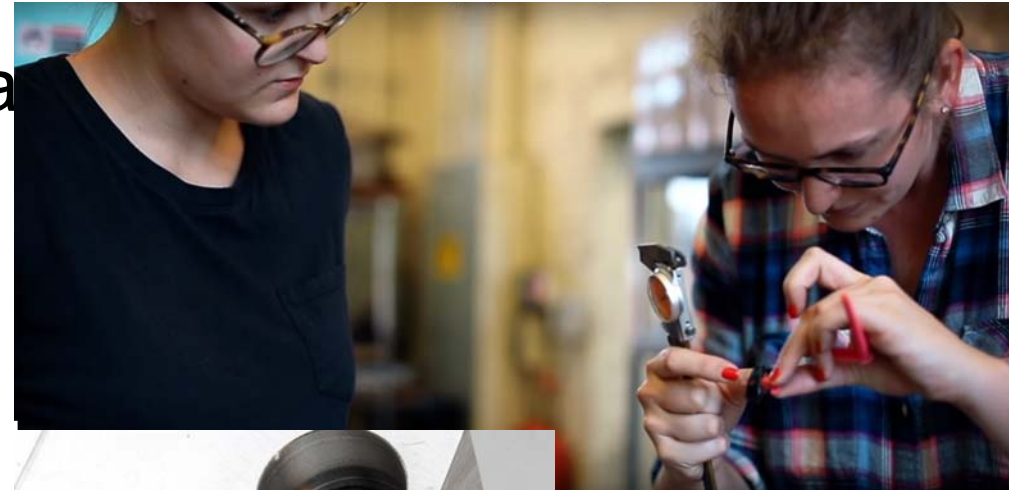
Background: The Product Realization Lab

- Part of the University since its founding
- 9000 ft² in 6 main areas: machining, woodworking, foundry, welding, plastics, and rapid prototyping
- Open to all students
- Shift and growth over the past 40 years:
 - 100 mechanical engineering students to over 1,000 students from across campus
 - Staffing change from one “boss” to graduate student Teaching Assistants (TAs) and a team of 4 faculty and 2 administrative staff



My Background

- Product Design '05, Mechanical Engineering '07 (TA position in the PRL)
- Worked as an engineer in the medical device field for 3 years
- Started back at Stanford in 2010 to set up and run a new lab space called Room 36
- I currently teach an Injection Molding course and an introductory mechanical engineering design course.



The Teaching Assistant Model at the PRL

- 18-20 graduate student staff
- 1 or 2 year commitment to work in the PRL
- Paid positions, 20 hours per week
- Work in the PRL is not just a “job”, but part of a TA’s education; an internship
- Support all PRL students and serve as design “coaches” for ME203 Design and Manufacturing



Training

- 2 weeks of full-time training before school year
- CPR/First Aid training
- Learning how to run the lab
- How to teach structured labs
- Coaching and mentoring discussions
- Building a strong team culture



Teaching – Safety Orientation and Culture

- Safety orientation sessions led by TAs
- Safety priorities: Human safety → Equipment safety → Project completion
- New students learn about the culture and rules of the PRL
- Clean-up time is important: 5 minute “shop jobs”



Teaching – Open Lab Sessions

- Each TA works 20 hours a week in 5 4-hour sessions
- TAs are knowledgeable but not all-knowing: they work with students to find answers



Teaching – Structured Labs



5	CLIP	MG106	1	STEEL
4	LENS	MG105	1	ACRYLIC
3	RING	MG104	1	BRASS
2	LUG	MG103	1	BRASS
1	HANDLE	MG102	1	DELTRIN
NO.	PART NAME	DRW. NO.	REQD	MATL

Assembly Notes

- 1) Silver braze 2 to 3.
- 2) Insert 4 into 3.
- 3) Retain 4 in 3 by Inserting 5 into groove in 3.
- 4) Screw 1 into 2.

MAGNIFYING GLASS			
DR BY: J. LARKIN	DATE: 9-26-88		
TOL. $\begin{matrix} \text{XXX} = +0.020 \\ \text{X.0XX} = +0.005 \\ \text{ANGLES } \neq \end{matrix}$	SCALE: 1 : 1	NO. MG101	

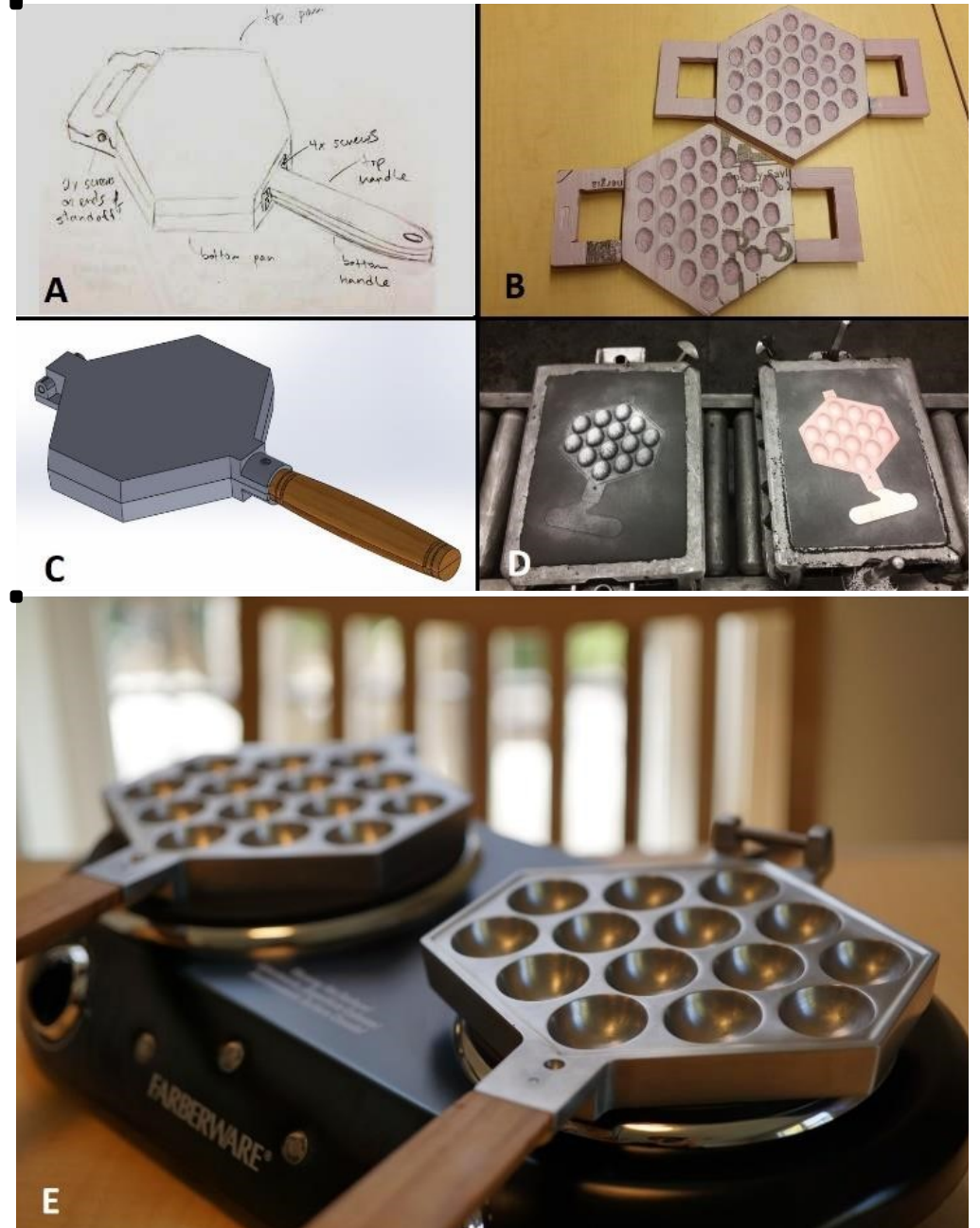
Coaching

- TA coaches meet weekly with a group of 5 “coachees” from ME203 Design and Manufacturing



Coaching - Example

- A. Sketches
- B. Prototyping
- C. CAD modeling
- D. Sand casting
- E. Final presentation



Rewards

- Financial support while pursuing a masters degree
- Off-hours use of the lab
- 2nd year specialization
- Technical, leadership, and social skills that make them highly sought after by companies such as Apple, Tesla, and many others
- Network of alumni TAs that share resources and opportunities



Reflections

The most important thing in my PRL experience was the TAs. Not only did they teach us how to use the tools, but they also **taught us how to think.**

I am referring to the thinking that solves problems; the logical way to run through options and find the one that will be most effective. They taught us to work towards a solution rather than obsessing over a problem.

As the weeks went on,

I got better at finding my own solutions.

Recognition

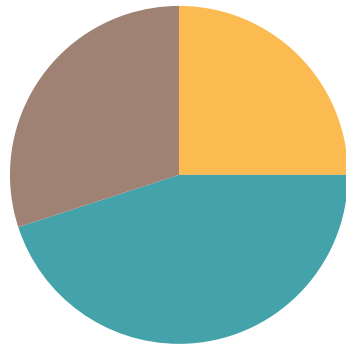
- Students in the PRL write about the supportive relationships they build with the TAs
- The 2014-2015 TAs were awarded the Centennial Teaching Assistant Award as a group, “The Product Realization Lab Nineteen”



Campus Collaboration

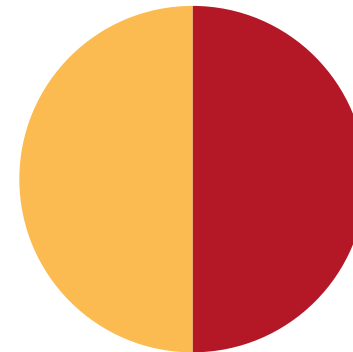
We want to engage students from all over campus—
so **building relationships with faculty is critical!**

Majors



- Non-Engineering
- Mechanical Engineering/Product Design
- Other Engineering

Career



- Undergraduate
- Graduate

***“Things that you learn by doing
are lessons that last for a lifetime”.***

-Kristen Haring, Instructor, History 301J Objects of History (<http://stanford.io/29LKKU0>)

Support organic relationships

Campus Collaboration: Writing

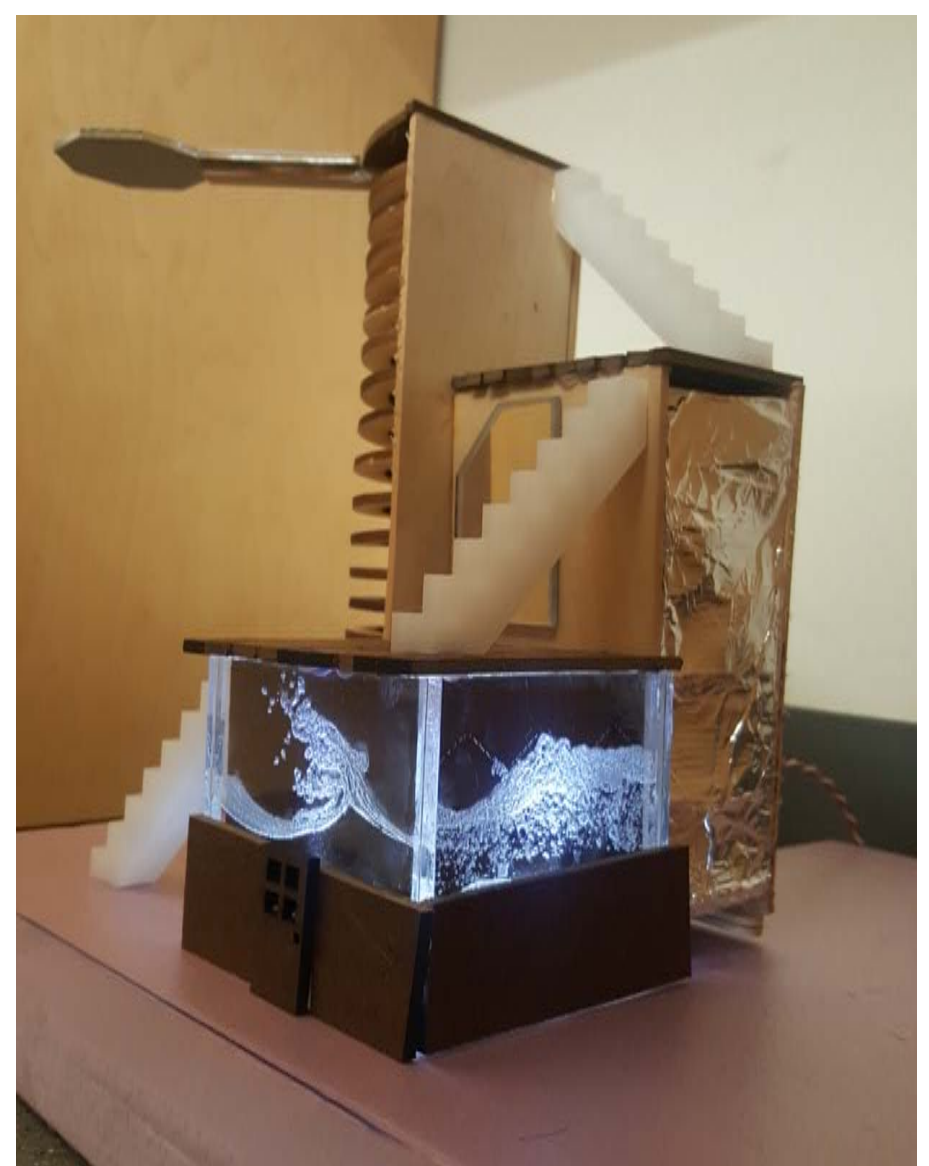
- **PWR2:** Architexts. Gabrielle Moyer, Lecturer in Program in Writing and Rhetoric

“It's been important to have students test out their ideas through modeling--every student said they discovered something new about the text they'd been studying in the process. It gets them out of the computer zone as well and into the building one, using hands, eyes, minds in new ways--and this seemed something they were really empowered by.”





Albert Camus' essay "The Myth of Sisyphus"



Based on David Foster Wallace's speech "This is Water"

Develop resources in partnership

Campus Collaboration: History and Ceramics

- **HISTORY 201J:** Objects of History: From "Material Culture" to "Making", Kristen Haring
- **APPPHYS 100:** The Questions of Clay: Craft, Creativity and Scientific Process, Hideo Mabuchi



Questions



Please don't hesitate to contact me with questions:

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