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Making Space: How the ENGD Makerspace promotes inclusion and belonging, and its success in doing so

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WWU Engineering and Design Makerspace

MAKING SPACE

How the ENGD Makerspace promotes inclusion and belonging, and its success in doing so

Noah Crow, 2023
With Prof. Jill Davishahl
Reflection on “Making Space”

This project has been very near and dear to me for the past three years! When I first entered the Engineering and Design department, still unsure if I was making the right move switching from Chemistry to Industrial Design and with no knowledge of the pandemic that would soon shake up my college experience, I signed up for what was then called Engineering 104, Introduction to Engineering & Design, with Professor Jill Davishahl. I went by a different name, then, and I still remember that on the very first day of class, Jill asked us to fill out a ‘get to know you’ questionnaire. In the space marked, “What else do you wish I knew about you?” I wrote, “I’m not sure what my pronouns are!” - the first time I’d let a professor in on what was then a secret.

Space to feel safe and comfortable, in both the bits of myself that I know and the bits that I’m still figuring out, has been somewhat hard to find throughout my time in the Industrial Design program and the Engineering department at large. A largely homogenous department, I often felt like a sticking-out sore thumb in my queerness, in my trans-ness, and I tended to look externally for sources of community and friendship. However, the Makerspace has been a lovely exception to the rule!

Not to spoil the surprise, but my project concludes with a series of suggestions I propose in order to improve women, trans and non-major students’ sense of belonging in the Makerspace. In particular, these suggestions include hosting events for women-and-trans students led by women and trans staff to intentionally teach stereotypically more ‘masculine’ and ‘techy’ tools. I suggest that this is hosted through a series or club format to strengthen bonds between attendees and staff. In addition, I suggest continuing to create ways for women and trans students to have agency in the space and to make room for contributions and culture change through art display space, facilitation of mentorship, and hosting community discussion nights.

As I’ve reflected on these suggestions over the past few days, I’ve realized that most, if not all, of them are things that I’ve benefited from, in one way or another, that have contributed to how truly wonderful it has been to work in the Makerspace for the past few years.
When I first started work there, it existed in a very liminal state - a past engineering student applied for a grant to purchase technology to start the Makerspace, I was lucky enough to be hired right at the beginning and assist in the set-up and development. I came in knowing next to nothing. I had never used any of the equipment - not even a sewing machine! - and over the summer of 2021, I cleaned the space (an old storage closet in a past life), painted and sanded furniture, and explored the various machines and tools alongside Lisa Collander, ID lab tech. While I was definitely feeling some imposter syndrome about not knowing how to use any of the equipment, Jill reassured me that being a new learner would give me a unique perspective to understand how students coming in to learn the equipment would feel. Being given permission to learn and explore and be bad at the equipment was amazing! My lack of expertise was a boon, not a bust, and it didn't matter that I felt scared or stupid or like someone with more experience would be better fit for the job.

Jill and Lisa poured knowledge and time and kindness and trust into me, and the freedom and agency I've been given over the space has been truly empowering. My art adorns the physical space and goes home with many students through stickers and badge projects. Hanging out and connecting with staff members on shift and at workshops and conferences has helped me make some of my strongest friends in the department. Talking to younger staff members and students in the space and commiserating about our experiences and trials has given me the opportunity to share advice I wish I could give my younger self, and to feel confident and optimistic about the future of the department, even though it was fairly challenging for me to navigate. Supervising the Makerspace has been such an important part of my identity and really helped me find my place in ENGD.

While there's no way to measure, I feel as though I got infinitely more than I gave through my time at the Makerspace. It's my hope that future students take the place and run with it - always changing, always filling more densely with connection and friendship, always waiting with open arms and a silly 3D printed slug for those of us who need it.
Problem: Current makerspaces often aim to ‘democratize’ making, but are typically frequented by affluent white cis men.\footnote{Marijel Melo, How Do Makerspaces Communicate Who Belongs?}
This is due in part to...

“Masculine, techy, or intimidating” stereotypes about equipment

Devaluation of what is typically seen as “women’s making”
These perceptions of making are “baked into” the architecture of the makerspace and are often in odds with the diverse communities that makerspace leaders strive to attract.

Marijel Melo, How Do Makerspaces Communicate Who Belongs?
Goals:

Create a space of **community and belonging for all students**

Make learning how to use Makerspace tools **accessible to all students**, regardless of experience level and background
How have we tried to meet these goals?
Equipment

Emphasis on ‘crafty’ and hands-on equipment

WHAT OTHER TOOLS ARE AVAILABLE?

Ask staff for help finding or using these tools!

- Button Press
- Grommet Press
- Soldering Kits
- Heat Press for Vinyl
- Markers and Colored Pencils
- Sticker Printer
- Serger
- Sanding Kits
- Cricut
- Laptops with Adobe
Layout

Centers open work space for collaboration
Aesthetics

Branding and color design

Logo and Badges designed by Ash Wheelock

FONT, SIZE AND TYPEFACE

Objektiv Mk1 XBold 48pt - title line 2

Specifies what the guide is (i.e., step-by-step, style guide, ...)

Objektiv Mk1 XBold 18pt - Title line 1

Specifies equipment (laser cutter, sewing, etc)

HWT ARTZ REGULAR 18 PT - HEADING

#064972 #fbd1c #f04f47 #892c2c
Aesthetics

Craft on display
Badges

Required for all, online access

**ONLINE**
- Join Canvas page!
- Overview + Learning objectives
- Readings, media + resources
- Safety protocols
- Assessments (quizzes)
- Preparing for the project

**PROJECT BASED**
- Come to the Makerspace!
- Staff welcome
- Start project
- Step-by-step + staff guidance
- Submit project to Canvas
ROTARY CUTTER
STEP-BY-STEP

READYING THE LASER CUTTER:

1. Turn on the Epilog
   - Click on the up/down icon on the touch screen
   - Use the joystick to lower the bed about 6”. This will take a while! Keep going until you can see the rotary attachment site on the right hand side of the bed
2. Turn off the Epilog
   - Grab the rotary attachment from the shelves to the left of the printer. A Makerspace employee can help you find it!
3. Place it in the upper left corner of the bed with the cord to the right
4. Plug the cord into the attachment site on the right-hand wall of the bed

attachment site
Badge projects

Art-focused, not “techy” or mechanical
Student engagement liaisons

Workshop/craft events, mentorship and support, listening sessions and discussions, career events
Student-staff led workshops

Student-staff-directed and planned, materials provided for attendees
Staffing

Through the STC and ENGD, diverse community
Aprons

Staff clearly indicated, help available
In the spring of 2022, when the Makerspace had been open for almost one academic year, we sent out a survey to every student enrolled in the Makerspace canvas course.

Questions ranged from demographics, to experience with the badges and equipment, to how students felt about the space itself and their experience within it.
Participants were asked to rate, on a scale of 1 - 10, how much they agreed with various statements, including:

I feel a **sense of belonging** to the makerspace

I know **I can get the help I need** when I come to the makerspace

I **see myself as a part of** the makerspace
How many people responded?
How did students respond?
Engineering major (electrical, plastics and composites, manufacturing, and industrial design) vs non-engineering major (all other, undeclared)
Part of **historically excluded community** (non-white, cis, and/or male) vs not historically excluded

<table>
<thead>
<tr>
<th></th>
<th>HEC</th>
<th>Not HEC</th>
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<tbody>
<tr>
<td>Sense of Belonging</td>
<td>7.5</td>
<td>7.5</td>
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<tr>
<td>Help Availability</td>
<td>9.0</td>
<td>8.5</td>
</tr>
<tr>
<td>Part of the Space</td>
<td>7.0</td>
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</tbody>
</table>
People of Color vs White

- Sense of Belonging
- Help Availability
- Part of the Space

POC vs White Comparison Chart
Women vs Men

- Sense of Belonging
- Help Availability
- Part of the Space

Comparison between Women and Men.
How many women and people of color respondents were not ENGD majors?

**Women**
- Non-ENGD Majors: 46.7%
- ENGD Majors: 53.3%

**POC**
- Non-ENGD Majors: 29.4%
- ENGD Majors: 70.6%
**Takeaways:**

- Non-majors and women don’t feel as great a sense of belonging and membership in the Makerspace.

- Students from historically excluded communities feel able to get help in the Makerspace.
How can we use this information going forward?
Possible ways to increase belonging for non-majors

Host more workshops or clubs with repeated engagement

Partner with more clubs and organizations, like this workshop with the Counseling and Wellness Center

Lead tours at scheduled times
Possible ways to **increase belonging for non-majors**

More social media/advertisement outside of engd spaces, outside Ross ET south entrance

Continue to staff with students outside of ENGD

Remove ENGD from the name
Increase ways for **students to have agency over the space**

**Interactive artwork/displays**

**Expand leadership opportunities**

**Student/community-led workshops**
What about the gender disparity?
A study was conducted by Professor Davishahl examining the Student Engagement Liaison program after its first year.

The study set out with the research question, “What was the experience of the student engagement liaisons in their first year as mentors?” However, the two female SEL's reported their experiences very differently than the two male SEL's, leading Prof. Davishahl to reframe the question to, “How do the student engagement liaisons perceive their roles as mentors?”
The women reported a much greater emphasis on **engineering culture change and promoting inclusion.**

I didn’t know I was passionate [about] STEM inclusion issues. I like what I contribute to work on these issues.

I think our events evolved a little bit which makes me happy. The newer event is focused more on *impacting students' quality of education and life* in school.
How can we increase women and trans students’ sense of belonging in the Makerspace?
Host **women-and-trans student events** led by women and trans staff¹

¹ Tera Capel, *The Making of Women: Creating Trajectories for Women’s Participation in Makerspaces*

Intentionally teach stereotypically more ‘masculine’ and ‘techy’ tools

Create a series or club to strengthen collaboration and community
Continue to create opportunities for women and trans students to get involved in the space, have agency, and make change.

- Invite improvements and contributions to the space by women and trans students
- Facilitate mentor/mentee opportunities
- Host community discussion events
Thank you!


