

Peer Mentor Perceptions of Creating Training Materials for Their Successors (NSF IUSE)

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Peer mentoring is an integral part of the educational development of engineering students. Student-to-student mentoring occurs informally in areas such as study groups (Herzog et al., 2025; Huizing, 2012) and more formally as undergraduate tutors in specific courses (Marshall et al., 2021; Sharp, 2021). This work examines peer mentoring occurring within an academic course-based makerspace, with hands-on design as part of a structured introductory first-year design course.

Students hired as peer mentors for the first-year makerspace-based course have demonstrated technical skills within solid modeling, 3D printing, Arduino electronics, and programming. These skills are fundamental to the project-focused course. Additionally, students are selected to be peer mentors based on their communication skills and positive disposition when working with others. Training of new peer mentors has traditionally relied on the skills and knowledge of experienced peer-mentors, as they informally train the new peer mentors, preparing them to work independently as a peer mentor in the next semester of the first-year makerspace-based course.

Our NSF IUSE supported project focuses on developing a formalized preparation program for peer mentors working in makerspace-based learning environments. The course content is designed to prepare peer mentors in educational methods and support their development of the skills necessary to facilitate the learning and social development of first-year engineering students. The formal peer mentor training course structure has been developed to provide new mentor training focused on the following six primary topics: Social Belonging, How People Learn, Fostering a Growth Mindset, Student Identity, Effective Observing, and Facilitating Group Interactions (Dickrell & Nadelson, 2025). Each module in the course includes instructional materials and content, scenario videos created by peer mentors, and engaging, authentic learning activities.

Project Focus

The focus of this work is on the peer mentor created case scenario videos. Existing course peer mentors were asked to develop case scenario videos focused on the six peer mentor training course topical areas. Peer mentors were asked to reflect on their experiences in facilitating peer learning in the course. From their first-hand experiences and discussions as a group, the peer mentors then developed scripts for case scenario videos they thought would be valuable in preparing new incoming peer mentors across the six topical areas of the course. Other than a few meetings with a faculty member to review best practices for creating open online content, the peer mentors operated independently in developing their scripts, acting in their skits, and producing videos for new mentor training.

We examined the peer mentors' perceptions of this content creation experience to understand:

- 1) Why the current peer mentors created certain scripts in their makerspace support cases to highlight for new peer mentor training, and
- 2) How the experienced peer mentors gained deeper understanding of mentoring and developed professionally through the process of creating case scenario scripts, acting, and producing videos.

Peer Mentor Demographics & Prior Experience

Eight peer mentors participated in the creation of the course content videos to train the next generation of makerspace classroom mentors.

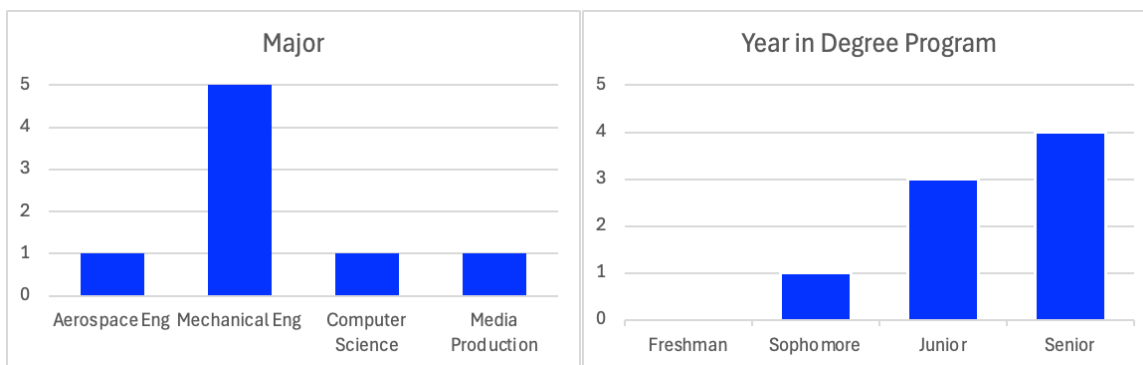


Figure 1: Major and year of study demographics of peer mentor content creators.

Students participating in the training video creation overall had low to intermediate prior experience creating video content for instructional, entertainment, or course assignments.

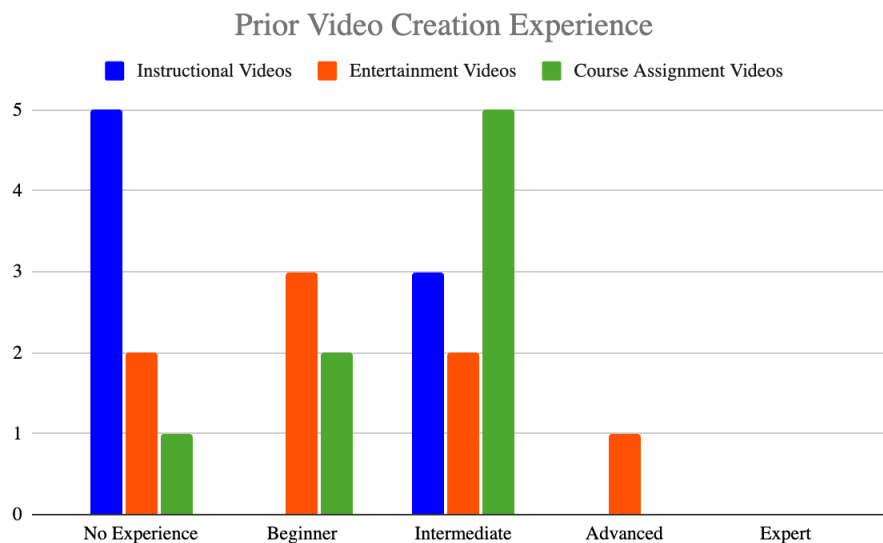


Figure 2: Peer mentors prior video creation experience levels.

Peer Mentor Roles During Video Creation Process

The peer mentors on the video creation project were not formally assigned roles in the video creation process. They were given general guidelines about the instructional modules the training course would cover, and were asked to create scripts and videos on their own they thought would be helpful as part of the class. In the process of video creation, they self-selected into fulfilling multiple roles of script writing, acting, directing, crafting props and overseeing the audio and visual equipment use.

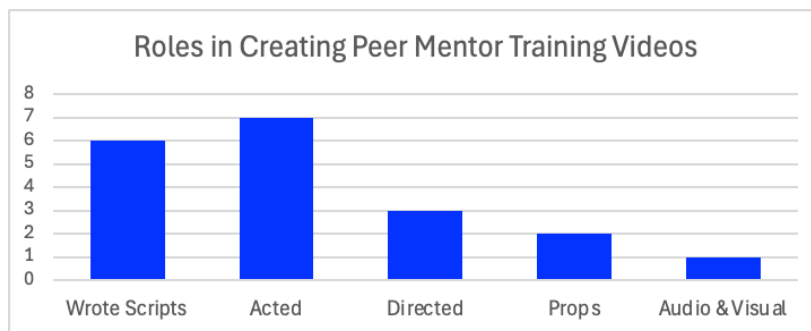


Figure 3: Peer mentor creator self-selected roles during training video creation process.

Following the creation process, the peer mentors were asked in an open-ended question to reflect on which aspects they found the easiest or most challenging about the instructional video creation process for this peer mentor training course project.

Easiest			Most Challenging		
script writing	3		video recording, audio, lights	3	
acting	2		acting	2	
idea generation	1		time management & scheduling	2	
creating props	1		idea generation	1	
directing	1		dialogue	1	
cinematography	1				
group work	1				

Figure 4: Reflections on easiest and most challenging aspects of creating instructional content.

There was a great variety of responses to both the peer mentor self-reported easiest and most-challenging aspects to the video creation process, indicating that the group of eight student

mentors participating had a good mix of both video production related interests and opportunities for growth during the project.

Peer Mentor Perspectives on Impact of Video Creation Process

Post video content creation the peer mentors were asked to free-response reflect on four key aspects of the impact of the video creation project: Content Selection Motivation, Understanding of Mentoring, Professional Development, and Critical Course Topics. Peer mentor open narrative responses were evaluated for emerging codes and the most commonly reported response and a representative quote are included for each category.

1. **Content Selection Motivation:** *Knowing the videos are intended to be used to prepare new peer mentors, what motivated you to include the content you chose in the scripts and/or videos?*

The most common category for an answer among peer mentors narrative responses to this question was the ***Desire to Help New Mentors***.

A typical response illustrating this is, *“I was motivated by knowing that this was my chance to show a future peer mentor what I would have liked to see when I was in their position.”*

2. **Understanding of Mentoring:** *How has your understanding of mentoring been impacted from this process of creating case scenario scripts, acting, and/or producing videos?*

There was a two-way tie for the most common category for an answer among peer mentors narrative responses, they most highly commented in the categories of: the ***Importance of Mentors Learning from Mentors***, and the ***Impact of Peer Mentor Empathy on Students***

A typical response illustrating mentors learning from mentors is, *“It has been helped because in creating scripts, I got to see what other lessons that other peer mentors have learned and what things they have encountered.”*

A typical response relating to student empathy is, *“Through producing these videos, I came to understand that the main characteristic of a great mentor is someone who can empathize with a student. This was consistent with all of the videos that we generated. A good mentor looks out for struggling students, asks questions to understand the root cause of their issues, and proposes solutions that guide students in the right direction.”*

3. **Professional Development:** *How do you feel you have developed professionally from this process of creating case scenario scripts, acting, and/or producing videos?*

The most common category for an answer among peer mentors narrative responses to this question was ***Teamwork & Collaboration***.

A typical response illustrating this is, “*I would say that my collaboration skills grew significantly throughout this experience. Working with the other peer mentors, both in planning expectations and coordinating the filming process, really strengthened our teamwork.*”

4. **Critical Topics Insights:** *Based on your experience, what do you consider to be critical topics that should be included in a peer mentor training course for working with undergraduate students in makerspaces supporting courses?*

There was a two-way tie for the most common category for an answer among peer mentors narrative responses, they most highly commented in the categories of:

Approachability & Student Comfort, as well as ***Supporting Group Work***.

A typical response relating to approachability is, “*Learning how to be approachable and inviting so that students feel comfortable asking questions in the first place.*”

A typical response relating to group work is, “*I would say that including a module on conflict mediation ... is extremely valuable for peer mentors. In a class that relies heavily on collaboration for a major final project, understanding how to support and communicate with diverse students is essential.*”

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