

Work in Progress: How a Mixed Experience Learning Assistant Seminar Functions as a Community of Practice

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The Learning Assistant (LA) model for peer instructors emerged from physics and biology education but has recently been gaining momentum in engineering departments [1], [2]. LAs are undergraduate students who facilitate student thinking and encourage inclusive active learning in the classroom. They participate in weekly preparation sessions with their supervising faculty, where they provide input as active members of the instructional team for their course. LAs also participate in a pedagogical training program, a key element of the LA model [3]. In many institutions using the LA model, LAs are involved in the pedagogical training for just their first semester of practice. However, there may be benefits to providing sustained pedagogical training and reflection across multiple semesters of LA participation. Research is needed to explore the affordances of mixed-experience pedagogical training for LAs.

This study looks specifically at LAs within the mechanical engineering department at a small private university in the northeastern US who participated in the program over two academic years. A unique aspect of this department's pedagogy seminar is that both veteran and novice LAs took part in the pedagogy course. We, as the facilitators and program coordinators, began to notice the veteran-novice interaction as becoming central to the functioning of the group, so we turned to Lave and Wenger's framework of community of practice [4] to document and understand what was happening. The central question for this study is: How does this unique mixed-experience context for engineering LAs exhibit characteristics of a community of practice?

Framework

The *community of practice* framework, which drives this study, revolves around the idea of practitioners in a task or discipline (a) communicating with each other about the strategies and struggles that they have encountered while practicing their craft and (b) collectively refining their strategies and working through their struggles. These communities provide *context* and *content* to learning. Over the course of continued involvement, individuals within these communities transform from *legitimate peripheral participants* to *core participants* [4], [5]. This community of practice framework has been applied to many contexts, including healthcare [6], social workers [7], and a community of teachers [8]. This study looks at how members of the mechanical engineering learning assistant community from different class years and experience levels interact with each other and how they perceive the influences of those interactions on their LA practice.

Data Collection and Analysis

The data for this study came from retrospective interviews with 13 mechanical engineering LAs who had between 1 and 4 semesters of experience in the program, including its weekly pedagogy seminar. The interviews followed a semi-structured protocol (see Appendix) and asked the LAs to describe from their perspective the department's LA program and their role within it. To explore whether LAs would spontaneously describe the program as a community, the interviewer intentionally avoided using the word "community" until the final segment of the interview.

To start the analysis of the interview transcripts, we did an initial cycle of structural coding [9] to identify all LA turns of talk related in any way to depictions of communities of practice (COP) in the research literature. This cycle resulted in a data subset that included multiple turns of talk from all 13 LAs. Next, with that subset, we conducted a round of open coding which led to a draft set of coding categories. These categories described specific COP features present in the LAs' descriptions of their experiences in the LA program. Finally, we re-coded the entire subset, doing constant comparison to refine the draft categories and their definitions [10]. This process resulted in 9 categories, which we grouped into four major dimensions.

Findings

We found that each of the 13 participating learning assistants discussed aspects of a *community of practice*. We organize our findings by four major dimensions of alignment between the community of practice framework and the LAs' descriptions of their experience: *community space*, *mixed experience of members*, *shared mission*, and *development of expertise*. To protect the identity of the students, pseudonyms are used.

Dimension 1: Community space. The LAs placed importance on their intentional gathering into a shared space (either physical or virtual) for pedagogy seminar. Here we highlight two aspects of that community space that stood out to the learning assistants.

Safe space. The LAs described the pedagogy seminar environment as a place where LAs could be vulnerable and open. When asked what stood out to him from seminar, Nick replied:

I don't think it's necessarily a people or discussion that stands out. It's more of the atmosphere of it and how like it was a very comfortable environment for, like, expressing what happened and what was going well and what wasn't, and was like a great... feeling of having a good resource of support of other people who are as invested as you were in trying to do a good job with the program and seeing it continue. And so, knowing that you know, whatever you bring up people will take seriously enough to give you the help that you want.

Culture and norms. The LAs' descriptions of the LA program made it clear that they perceived a group culture with its own norms for between-member interaction. For example, Georgia talked about how the established culture of the group made it easier to fit in when joining the group as a new LA:

I mean, like I said, like the people who repeat semesters start to like... like, that is, like, the foundation of it. And people who join, you can see that how the people care about each other and they care about helping each other. I think it's pretty easy to, like, fit into that if you come in, without having done it before. [...]

Dimension 2: Mixed experience of members. The LAs emphasized that the mixture of experience levels among the community members strongly influenced the interactions that occur in this community space. Generational encounters are an important part of a community of practice [5].

Veterans giving advice. Returning LAs had experience under their belt to pull from and they were able to give advice from that experience. Macy, a newer LA, described the benefits of having veterans participate in their weekly meeting:

It was really helpful to have... like the advice of people who had been LAs multiple times, because I think some- some of like the new LAs would come up- like talk about their problems and a senior LA would be like, “oh, I had this exact same problem, like a year ago, this is what really worked for me.”

Veterans normalizing challenges. The LAs noted that being an LA comes with challenges, and having veterans around to validate those challenges can be helpful to newer LAs. Annie found it particularly helpful:

For me personally, because last semester was my first semester as an LA, so it was kind of like, “I have no idea what I’m doing” or “how I’m supposed to be doing this?” so like hearing, even from Iris... and like [another LA], people that were like older than me and have had this experience before that they were also struggling doing the same things I was, was really validating.

Dimension 3: Shared mission. In order to be a community of practice, the LAs need to have a shared mission. The interviews revealed that they had a clear sense of mission to help improve undergraduate education within the Mechanical Engineering department.

Collaboration. The LAs emphasized that they worked together collaboratively to improve undergraduate education as well as to help make each others’ roles easier. Lillian realized that an LA in the class she was taking was having a hard time eliciting student participation, so she made a pointed effort to participate in her own classes:

At least I remember when [another LA] was talking in the informal seminar chat, she was kind of talking about how there was a lack of participation in her like [Materials & Manufacturing Class], um, breakout rooms, when she would hop between rooms, and I was in that class so, then I was more inclined to, when she popped in the room kind of just, even if I didn't have a question, kind of just engage with her, because I was like, ‘I understand where you're coming from’, so I think that community aspect of helping each other at our jobs is really- I think really neat.

Agency to reform larger community. The LAs perceived a need for more active learning in the Mechanical Engineering curriculum and felt that they were able collectively to have an impact on meeting this need. For example, Miles reflected on how courses changed over his time as a student:

You know, everybody else who helped you out- you, you and others was... really propagated by way of the LA to the professors, and you know that that feedback loop was established and more active learning elements were blended into those courses. As the LA- as the LA process progressed and... yeah, I think that was a- that- that that active learning debt and the emphasis on it definitely seems to have kind of... spread throughout the Mech E community in a way that I was really appreciative of... by- by the time I left, and I'm sure the process has been continuing since then. -Miles

Within-course troubleshooting. There were groups of LAs that were working in the same course, so they communicated among themselves to help improve their specific course. For example, Miles described how he and the other LAs for his course used what they learned to help improve the student experience within it:

Our- our teachings I guess the... the combined efforts of the four of us who were- who were LAs for the course were able to... I think we were able to- like I said, establish that feedback loop with the professor to- to facilitate more effective learning for the students in the course. We heard a lot

of frustration from them about how... about how the information just wasn't really being presented well? And this- this I mean was before COVID. And you know the- the engagement level was... kind of struggling, as I recall. And... yeah I mean we- we had all our weekly meetings with [professor of course] and were able to... were able to get the gears turning on just some more effective learning strategies in general that he could apply during lecture as well as in the individual lab sessions.

Dimension 4: Development of expertise. The LAs expressed that interactions with other LAs both within and outside of the seminar helped them improve their strategies and techniques to for facilitating student learning.

Sharing techniques. LAs recalled specific interactions that fostered growth or new ideas about how to refine their techniques. For example, Reese recalled techniques other LAs shared within seminar:

I definitely like remember people's individual takes on things a little bit more um like... I remember [another LA] was very much like, "oh yeah, if the students don't want to answer my questions, I just kind of walk away and like go to another group," like, and that was sort of his approach to things. And I know that, like I- like Allison would sort of squat down by the desks to like- have like eye contact with the students was like something I remember and I was like "oh, should I do that?"

Reflection on own practice. The LAs noticed that the pedagogy seminar gatherings gave them an opportunity to examine at their own practice and think about how they could become a more effective LA. For example, Iris described how the seminar made her really think about how she behaved as an LA:

I think the- time of seminar really helped me kind of confront things that I wasn't necessarily doing the best, and so the way I think I initially thought I should approach being LA changed, um, and that, I think, was something that was really helpful, because I kind of like went into it like not really sure what exactly my role was. I thought, maybe it's like a kind of like... a TAing position um, and so I think I did a lot more answering students and certain- instead of like helping them get to the answer um and there were certain things that I like noticed about myself, and I was like was able to confront.... There was like some points where I would like catch myself almost like interrupting to like take students on a different path and then- because seminar really helped me kind of like confront those and figure out like how to like actually not talk as much when you're helping students and just kind of like let them go off.

Conclusion

This preliminary analysis suggests that this unique mixed-experience context for engineering LAs does exhibit characteristics of a community of practice. When LAs with differing experience levels interacted over multiple years within the same single-department seminar, they found that their work as LAs was meaningfully influenced by those interactions. Four overarching dimensions of a community of practice were apparent in the LAs' reflections: *community space, mixed experience of members, shared mission, and development of expertise.* Providing a consistent and structured opportunity for engineering LAs to interact with each other at all experience levels seemed to help them develop as facilitators of student learning and provide them with motivation to work toward the goal of improving educational experiences in

their engineering department. Future work for this study will include a more comprehensive analysis of the interview data and will triangulate findings with field notes on the actual interactions in the LA pedagogy seminar.

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Appendix: Mechanical engineering LA community interview protocol

In your own words, how would you describe the role of an LA?

What do you think the LA program brings to the Tufts Mech E department?

Tell me about the elements that you think bring about the positive things happening through the LA program. What about for LAs?

I'm interested in the LA Seminar and how you connect with each other.

What do you view the purpose of the MechE LA Seminar as?

If you were to describe to a friend or family member, what would you tell them our meetings are like? Follow up if they're stuck: What would you say about the people, content of discussion, or the way people interact?

What stands out in your memory from LA seminar? Are there particular people or discussions that stand out more than others?

Can you tell me about a person or a topic that connected to your actions as an LA in the course?

Remind them of which other LAs were there during the seminar over the course of their LA journey.

If LA'ed for more than one semester: Can you compare and contrast these semesters? What stands out from each semester about how you felt and your role?

How do you think the way you worked as an LA would have been different without the weekly meeting across classes?

Zoom back out

Do you think the MechE LAs are a community? Why or why not?

If yes: how would you describe the LA community?

To what extent does it matter that it is (or is not) a community? How has it influenced your experience as an LA?

Do you think there are subgroups within the LA community? If so, how does that influence the weekly seminar?

A unique aspect of our seminar in comparison to other pedagogy seminars across the country for LAs is that veteran LAs participate in our weekly seminars. How do you think that impacted your experience as an LA and the program as a whole?

*Follow up questions along the lines of: Could you explain what you mean by ___? And Tell me more about ___.