The Benefits of Discipline-based Communities for Faculty Teaching Development

Dr. Margret Hjalmarson, George Mason University

Margret Hjalmarson is a Professor in the School of Education at George Mason University. Her research interests include engineering education, mathematics education, faculty development and mathematics teacher leadership.

Prof. Jill K Nelson, George Mason University

Jill Nelson is an associate professor in the Department of Electrical and Computer Engineering at George Mason University. She earned a BS in Electrical Engineering and a BA in Economics from Rice University in 1998. She attended the University of Illinois at Urbana-Champaign for graduate study, earning an MS and PhD in Electrical Engineering in 2001 and 2005, respectively. Dr. Nelson's research focus is in statistical signal processing, specifically detection and estimation for applications in target tracking and physical layer communications. Her work on target detection and tracking is funded by the Office of Naval Research. Dr. Nelson is a 2010 recipient of the NSF CAREER Award. She is a member of Phi Beta Kappa, Tau Beta Pi, Eta Kappa Nu, and the IEEE Signal Processing, Communications, and Education Societies.

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A common challenge in faculty professional development for teaching is helping faculty translate teaching strategies into their particular teaching contexts. A part of that challenge occurs when faculty have difficulty identifying how a general strategy like in-class problem solving can be implemented in a setting such as a large class or a class with a large amount of content. In addition, faculty sometimes feel like they don't have people to talk to about their teaching who understand their discipline and the specific challenges and opportunities it might present. To address this challenge, we formed department-based teaching development groups led by faculty with experience and interest in interactive teaching. We define interactive teaching broadly to include teaching that moves beyond lecture to engaging students in working with the content during class. This could include strategies as simple as a think-pair-share questions, short items with clicker response systems used during lecture or entirely flipped classrooms where students spend the majority of class time working on tasks individually or collaboratively. We focus on the development of a community defined as "the development of a shared identity around a topic or set of challenges. It represents a collective intention - however tacit and distributed - to steward a domain of knowledge and sustain learning about it." [1] (p. 9)

Project

Our lessons learned paper focuses on a set of faculty development groups that were active in STEM departments over a multi-year period. These groups operated based on the SIMPLE (Sustainable, Incremental change, Mentoring, People-Driven, and Learning Environments) Design model for faculty teaching development. The SIMPLE Design model provides a structure in which instructors meet on a regular (anywhere from weekly to monthly) basis to learn about research-supported teaching strategies and receive support and feedback as they try those strategies in their classes. Additional details about the model can be found in [2], [3]. A central element of SIMPLE teaching development groups is that they are discipline based; groups are centered within a single department or anchored by a shared program or curriculum. This characteristic of the model was motivated in part by the fact that STEM instructors often find it challenging to translate general teaching advice and strategies to discipline-specific contexts. We hypothesized that grouping instructors by discipline would facilitate "translation." The model is also consistent with recommendations for professional learning communities to include participants with common concerns or needs [1], [4].

Groups and Participants

As part of the project studied in this paper, SIMPLE teaching development groups were formed in six STEM departments at a single large, research-focused institution. Group members were interviewed yearly to learn about the structure and functioning of their groups, their motivation for participating, what they found most (and least) valuable about being part of the group, and if/how participation was impacting their teaching practice.

Our guidance to group leaders was to identify people in their departments who were interested in learning more about interactive teaching or who might already be using interactive teaching. So, rather than "converting the unconverted" we wanted department-based discussions of teaching to

first begin with those most interested in working on their teaching and trying new things in their classes. We viewed this recruitment process as providing support for those most interested and helping to coalesce groups together so faculty would feel less like they might be the only one trying interactive teaching in their classes.

Data Collection

The paper is grounded in analysis of interviews with participants (16 at the end of year one, 25 at the end of year two) and leaders (6) over a two-year period. Some participants were involved for only a year and some were involved over both years. The interviews were conducted in the summer following each academic year of the project. The questions focused on their teaching practice and what they were learning in the groups. We have begun analyzing the transcripts using a value creation framework [1] about professional learning communities. This framework includes a dimension about knowledge and resources that participants both contribute to the group and receive from the community.

Benefits of Participation

As participants described the activities and discussion that took place within their groups, the impact of having a shared discipline among the participants within each group became evident. One benefit was that participants were familiar with the courses taught by other members of their group and could easily map prerequisite knowledge and skills through the curriculum. This allowed for more in-depth discussion of challenges and potential solutions in a course-specific context. A related benefit was the discipline-based group's familiarity with standard teaching approaches for disciplinary content and their ability to assess potential advantages and disadvantages of an alternative teaching technique for that content.

Common Knowledge of Content

Participants commented on the importance of a shared knowledge of discipline that allowed for discussion relevant to the content they were teaching. One participant described this specifically as follows: "it provided a formalized way of having these discussions on improving teaching and…the, you know, formalized groups were with people that were in my same field, so understood when I talked about my Statics class or I talked about my Structural Analysis class, every one of those people have taken those classes at some point." The participants started with shared understanding of the content and background either taking or teaching related courses in the discipline. This helped move the discussion forward without having to explain the content to someone from a different discipline.

Common Knowledge of Courses

The department-based structure provided the participants comfort and support in learning from other people facing the same kinds of challenges in their teaching. Fellow group members had experience teaching similar courses so could anticipate possible pitfalls and provide feedback based on experiences with some teaching strategies. Related to STEM-specific courses, participants discussed particular challenges of teaching STEM. For instance, the possibility of large class sections that would make strategies like detailed feedback on assignments challenging or infeasible. It also provided space to decide what might not work as well as what would. As

one participant stated, "I am a big believer in learning from the mistakes of other people, so that if you are skillful and can avoid getting yourself into a bad spot, then it's important to listen to others who may have explored that path and found it to be unsettling. So, hearing from *[other faculty]* about, here's the ups and downs of using clickers in the classroom, that meant I didn't have to try that myself. I could sort of determine – ah, right now, I can see it would provide these benefits, but it would provide this sort of additional overhead, and it's not right for the way I'm running my class right now."

Translating General Resources into a Specific Context

Some groups used books as a source of discussion for their groups, but participants also brought strategies they might have learned or tried based on other resources (e.g., conferences, university-level workshops). In either case, they faced translating a general strategy into their own teaching context, e.g., taking a suggestion from a book to do more formative assessment and then consider how that would logistically happen in a large class, or how to both support student discussion in small groups (e.g., a think-pair-share question) while maintaining some control over the discussion that might be happening in a large lecture-style classroom. As stated by one participant describing what they learned, "Fresh ideas. Getting other people's perspectives on what I was doing, and then also just hearing people's ideas. And, having them – it was, so I read a bunch of books on teaching, right? But it was nicer to hear it from a person from a person who's done it, and so you can just ask, like, "Does that really work? You ask them to write down a poem and they actually wrote down a poem? Like, what were the struggles with that?" But, so it's nicer to have an interactive discussion than just reading about techniques in a book. Because sometimes it's hard to imagine actually implementing some of the techniques."

Participants also worked to translate their strategies based on the nature of their discipline. For instance, they recognized that giving feedback to students about computer programming code would be different than feedback about a paper. The department-based group provided a space for talking about teaching with people who potentially had expertise about the teaching strategy and how to use it in a class within the same discipline. Group members felt a better sense of support for trying a new strategy when they could get feedback from individuals who could help them think through potential pitfalls and help them think about what to change for next time based on related experience in similar courses. In addition, one group used *Teaching and Learning STEM* [5] as a source of discussion, which they found more relatable than the other, more general book about learning (*How Learning Works* [6]) because the authors understood the nature of STEM teaching and common course structures. One participant described the advantages of the *Teaching and Learning STEM* as follows "Versus the STEM book that we read – the Teaching and Learning STEM – was very cognizant of the scale-up part of that, and so had a lot of nice prescriptions for "if your class is yea big, you can do this, but if it's yea big, you might try this instead, which is a sort of adaptation of that." So, the frequent sort of arguments about scaling and also then, how most of our assignments involve computer code, like, how you'd adopt feedback that was mentioned, or grading schemes that were discussed to computer code."

Conclusion

Participants generally felt some combination of affirmation about what they were already doing to support students learning and learning new teaching strategies. The recruitment of faculty who were interested in interactive teaching provided a sense of common purpose and common interest that are necessary for learning communities. The discipline-based structure also allowed for easier discussion about the challenges and affordances of different teaching approaches and strategies. In continuing to analyze our data and the experiences of participants, we are interested in how their content knowledge for teaching develops [7]. While it may not have been the experience of all participants, we conclude with the personal comments of one participant about teaching being "alive" for the teacher and the students as motivation to continue examining learning communities for teaching development.

I think it makes me more like to teach. I like teaching more, because I feel that it won't be just go in there and repeat what I already know to the students, so mechanical. And the thing is that after I hear so many people - everybody's issues - I feel that teaching itself is a lively thing. It's alive. Teaching is not just mechanics. It's really dynamic. So, I think that's the most - that is, I think, something influenced me most. And because of this change, this viewpoint change, I think my way of approaching students is also different.

We suggest our lessons learned paper be presented as a lightning talk in order to support discussion with other participants who are also developing communities of practice.

References

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