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Board 358: Post-COVID Professional Development and Community Building for a Pedagogical Change Project

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Post-COVID Professional Development and Community Building for a Pedagogical Change Project

Project Background

This project, funded through the Institutional and Community Transformation Track of the NSF IUSE Program, aims to transform the culture in STEM departments at the home institution to one that values and prioritizes active and inquiry-based learning. The theoretical framework for the project builds on existing work on grassroots change in higher education [1] to study the effect of communities of practice and [2] to change teaching culture, with an emphasis on large introductory courses. We have established course-based communities of transformation (CCTs), faculty learning communities within three STEM departments that include faculty focused on highly enrolled gateway courses in each of the departments as well as faculty interested in improving teaching and learning.

The math CCT started roughly one year before COVID and the physics CCT was active for roughly six months prior to COVID. Timing relative to COVID is mentioned because the movement to online learning impacted the trajectories and schedules for teaching change efforts. Both of these CCTs started their work by designing a change plan that outlined the issues they wanted to target and then started to work towards those goals by making changes in the targeted introductory courses. The computer science department joined the project more recently, and its CCT is still working to design its plan for change.

Teaching change efforts spearheaded by the math and physics CCTs primarily focused on the structure of recitations. Math focused on redesigning calculus recitations to an active learning format in which groups of students solve problems on whiteboards while graduate teaching assistants (GTAs) and undergraduate learning assistants (LAs) provide feedback. Physics also focused on recitations in the calculus-based introductory sequence, developing and implementing tutorials designed to have students work on solving problems in groups.

For both math and physics, physical spaces in which students could work collaboratively and get feedback from faculty, GTAs, and LAs is a critical element of the student-centered learning models that they adopted. The shift to online learning, which lasted two years (longer for some courses), removed the ability for students to share physical work and space with each other and with teaching staff. Online tools that aim to meet these collaboration needs were not universally available to students, nor were the physical tools, such as tablets, necessary to use them. Even with equitable access to online collaboration platforms, physical interactions, flowing conversations, and even the ability for teaching staff to quickly scan the room would be lost. Hence, considerable effort was focused on supporting the transition to online learning and

capturing as many beneficial aspects as possible of the in-person models that had been developed.

Recent Activities

The past year has represented a return to "normal," at least in terms of the classroom spaces and we have used it as an opportunity to roll out activities that serve both as professional development and as ways to rebuild community after. Specifically, we have focused significant effort on (1) implementing new professional development opportunities for GTAs in the targeted courses and (2) holding reflection/re-planning activities for CCTs.

Pre-Semester GTA Workshop

In August 2022, we implemented a two-day pre-semester workshop for new GTAs in the participating departments. Introduction of this workshop was motivated by the significant role GTAs play in implementing teaching change in the large courses targeted by the project (e.g., leading recitations and labs) and the need for GTAs to have structured professional development before the semester begins. In the early years of the project, GTAs met semi-regularly within their departments during the semester, but we found that new GTAs often arrived with little or no teaching experience and needed professional development before the semester began to put them on track for a successful GTA experience. The workshop included interactive sessions focused on facilitating active learning, creating classroom community, addressing learning outcomes, and using grading rubrics. The training also included introductions to relevant campus resources (e.g., disability services) and a panel of returning GTAs who shared tips for success.

At the end of the GTA training workshop, participants were asked to complete a survey to give feedback on each of the workshop sessions and answer open-ended questions about main takeaways and suggestions. The majority of survey respondents found each workshop session to be very useful and valuable; the session on facilitating active learning were most highly rated with 85% of respondents finding them very useful and valuable. Further details about the structure and content of the workshop, as well as participants' survey responses can be found in [3]. Next steps for the GTA workshop include revising workshop content based on survey and focus group feedback, integrating new online GTA training modules developed by the institution, and expanding to engage additional STEM departments (with a long-term goal of institutionalizing the workshop across STEM).

CCT Reflection Workshops

Over the past few months, we facilitated reflection and replanning workshops for the CCTs in each participating department. The reflection workshops for CCTs were designed to give CCTs a

chance to review their change plans, reflect on progress, and strategize about next steps. Given the massive changes brought on by COVID, the CCTs' change processes looked much different than planned, The project team viewed reflection workshops as a way to help CCTs understand what they had achieved even with the challenges of the transition to online instruction and how they wanted to focus teaching change efforts moving forward.

In the physics workshop, CCT members agreed that using the tutorials that had been developed during the recitations was important to improving student learning. Participants identified several next steps to improve and sustain the new tutorial structure including gathering implementation notes from recitation instructors to improve how tutorials are used, revising tutorials to encourage a focus on conceptual learning rather than problem-solving procedures, hosting tutorials on a common platform for ease of access and revision, and restructuring course contact hours to allow more time for students to engage with tutorials.

In the math workshop, CCT members reflected on the significant accomplishment of arranging recitations in rooms with whiteboards (pre-pandemic) and with the necessary GTA and LA staff to provide real-time feedback. They also noted the value of holding weekly meetings to help GTAs prepare for the student-centered recitation model. Finally, they recognized the additional advising that had been put in place to help students choose between online and in-person classes to help address a post-pandemic drop in calculus grades. Looking to the future, their conversation centered on goals around improving coordination between faculty teaching lectures and GTAs leading recitations. Participants drew on how they had made teaching changes in the past to brainstorm ways to achieve improved coordination.

Because CS had not yet developed an initial change plan, their workshop took a slightly different format. The CCT leaders from physics and math briefly described the change efforts in their respective departments to provide examples. This was followed by some discussion by CS CCT members of how lectures and labs could be integrated to encourage active learning, as well as concerns about engaging reluctant students in group work. Participants also discussed reducing class size to increase one-on-one interactions between teaching staff and students. The CS CCT committed to continue strategizing in their weekly meetings.

For math and physics, the reflection and replanning workshops helped CCT members appreciate the impact of their teaching change efforts. The workshops also gave members a chance to brainstorm collectively about what they wanted to tackle in the coming year. For CS, the workshop provided an opportunity for brainstorming about how their introductory courses can be restructured to center active learning. For all CCTs, efforts will continue via regular CCT meetings and reflection workshops will be organized in Fall 2023.

References

[1] A. Kezar and J. Lester, *Enhancing shared leadership: Stories and lessons from grassroots leadership in higher education*. Palo Alto, CA: Stanford University Press, 2011.

[2] E. Wenger, *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press, 1999.

[3] J. Nelson, J. Rosenberg, and M. Snyder, "A Pre-Semester Professional Development Workshop for New Teaching Assistants," to appear in *Proceedings of the ASEE Southeastern Section Conference*, Fairfax, VA, March 12-14, 2023.