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BOARD # 229: Capacity-Building for Change in an IUSE ICT Project: Institutionalizing Mini-Activities

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Capacity-Building for Change in an IUSE ICT Project: Institutionalizing Mini-Activities

This capacity-building project builds and strengthens faculty communities and develops a culture of inquiry and conversations that are evidence-based and data-informed – with the goal of creating readiness for curricular and teaching transformation. It is funded by the NSF Improving Undergraduate STEM Education (IUSE: EDU) program, Institutional and Community Transformation (ICT) track (award no. 2021532).

While most curricular and teaching transformation projects and the use institutional data to inform such changes have been conducted at large institutions, often at research-intensive universities, this project explores engineering education change in the context of a public, regional, mid-sized primarily undergraduate institution (PUI) in the Midwest, namely the University of Southern Indiana (USI). The fall 2024 enrollment in the Pott College of Science, Engineering, and Education was 1,458 undergraduate students and 157 graduate students (in Teacher Education and Sport Management programs), and the USI total undergraduate was 5,347 students. About 60% of Pott College students are from the Southwest Indiana region.

This capacity-building project is designed to motivate faculty to consider evidence-based teaching strategies as they collaboratively explore questions on student learning and success in introductory and foundational undergraduate STEM courses, including early engineering courses and prerequisite mathematics and science courses. Ultimately, the goal of such changes to teaching is to enhance student learning success in STEM courses and student retention and graduation in engineering. The project motivation, objectives, and change framework for intentional capacity building by creating faculty communities and course-level data dashboards to inform changes in instructional practices and curriculum are described in [1] and [2]. The project activities also are grounded in the premise that "significant conversations and significant networks" can influence faculty as they develop their understanding of teaching and learning [3].

The project provides opportunities for faculty engagement at multiple "doses", including semester-long faculty learning communities and working groups, annual workshops, and mini-activities. This paper and poster summarize the mini-activities that were developed and implemented each semester. These mini-activities invite faculty and staff across all departments in Pott College to explore student success and retention issues prompted by institutional data and evidence-based practices. They incorporate short inquiry and small group discussion activities. In contrast to workshops and faculty learning communities, which require registration and expect participant commitment, the mini-activities leverage the college-wide meetings hosted by the dean before the start of each fall and spring semester. Attendance is expected at these college meetings which aim to share information to help faculty and staff prepare for the semester and recognize accomplishments; the dean's office sponsors breakfast during these meetings. Approximately 100-120 Pott College faculty and staff attend the meetings each semester. The mini-activities provide a common topic and experience for all faculty and staff, creating shared points for conversation and idea exploration. The mini-activities have been institutionalized as part of the agenda of the college meeting each semester as a result of this project.

The purpose of the mini-activities is to introduce instructional strategies, data-informed explorations, and facilitate discussion and sharing, as well as generate interest in faculty communities, which is another component of this capacity-building project described in [2]. Each mini-activity is a brief (about 15 minutes) interactive activity in which a brief scenario is used as the context for small group discussions using provided prompts. The mini-activity is presented using the Transparency in Learning and Teaching (TILT) framework [4], in which the purpose of the mini-activity, steps that are to be taken (both individual thinking and small group conversations. The mini-activity is introduced with brief context (ex: the semester is about to start, and you're wondering about the backgrounds of the students in your introductory class). Common prompts ask participants what they notice about the data or information provided and invite them to connect the information with their experiences, courses, program, and students. The intent of the mini-activities is to foster conversations between faculty and academic staff around teaching and student success.

Nine mini-activities have been developed and implemented since spring 2021 so far:

1. Exploring aggregate data on our students' high school GPA and 4-year graduation rates from 6 recent cohort years. The purpose was to consider factors that might impact student graduation rates by exploring academic data and how data might inform curricular decisions at the faculty and department levels.
2. Exploring how aggregate student background data for students enrolled in an introductory course inform teaching considerations and strategies. The purpose was to explore how student academic and demographic data might be used inform course planning and teaching at the start of the semester.
3. Exploring DFW rates (non-passing grades) for an example introductory course led to course and advising changes. The purpose was to consider an example of changes to Introductory Physics courses and advising to prompt questions and ideas for one's undergraduate program.
4. Exploring data on an introductory course sequence grades disaggregated by number of attempts (students who are taking the course for the first time or repeating). The purpose was to insights from course sequence data [5, 6].
5. Conversations about bottlenecks to student success, course repeats and DFW rates, and course sequences. The purpose was to explore questions and ideas related to student success in one's undergraduate program, particularly in the introductory STEM courses taken by freshman and sophomore student [7-10].
6. Exploring how an expanded student demographic and background data dashboard (in demo phase) that provides a snapshot of data about the students in introductory level course can inform teaching and course planning. The purpose was to explore data and ideas related to student retention and academic success in introductory courses taken mostly by freshman and sophomore students [11].
7. Considering growth mindset messaging and syllabus policies. The purpose was to explore teaching practices that help motivate students and can be impactful for students in introductory and foundation courses [12].
8. Reviewing sample syllabus language to identify opportunities support inclusive and growth mindset learning environments. The purpose was to explore syllabus content and what messages can help or hinder student motivation and mindset in introductory and foundation courses [13].

9. Exploring considerations for the first day and week of the semester to foster student engagement. The purpose was to consider how the first day of class can help or hinder student motivation and learning environment and set the stage for student success [14].

The notes from the small group discussions are shared across the college afterwards. This provides opportunities for participants to learn about what colleagues were wondering about and discussing. In addition, the notes provide insights to the project team on the perceptions, questions, and ideas from faculty across the college. These insights help inform future activities and approaches to fostering these evidence-based instructional practices and mindsets about teaching and learning. They also help refine the change framework that is being developed as we move from capacity-building to intentional development and implementation of programs to support faculty in making changes and enhancements in their evidence-based practices. The analysis is ongoing and will be presented in a future paper to highlight how they are used to update our change framework and activities.

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