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WIP: A Faculty Learning Community That Includes a Strong Support System to Promote Implementation of New Teaching Practices

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Work in progress: A faculty learning community that includes a strong support system to promote implementation of new teaching practices

Introduction

The field of educational research constantly leads to new and effective ways to foster learning with students. Implementing these new methods can require significant changes to class materials, course goals, and assessments [1, 2]. While engineering faculty are experts in the technical areas of their discipline, they may not be acquainted in the educational research of their discipline. Therefore, it is a challenge for faculty to devote significant time to professional development in their teaching. To guide and sustain faculty in professional development, institutions create communities that support, reward, and recognize individual faculty members in their engagement [3].

A Faculty Learning Community (FLC) is one type of program that can support faculty in implementing evidence-based pedagogies [2]. An FLC is a small group of faculty and staff who engage in an active, collaborative yearlong experience [4]. The program includes a curriculum that covers learning development and the scholarship of teaching, while also building a community of faculty. FLCs have proven to be effective because they foster faculty autonomy, build enthusiasm, and adapt to students needs [2]. Faculty can come together in FLCs with common interests in education reform and a focus to improve their practice. These spaces allow faculty to be connected and supported by a community of instructors [4, 5].

In the Applied Physical Sciences (APS) department at University of North Carolina – Chapel Hill (UNC-CH), we have created an FLC to support implementation of entrepreneurial minded learning (EML) based on a framework developed by the Kern Entrepreneurial Engineering Network (KEEN) [6, 7]. EML is a student-centered, constructivist pedagogy that helps students to develop methods of integrating knowledge, identifying opportunities, and performing self-directed and continuous learning [8]. The APS department is using EML as the driver of our new engineering major and minor curricula. This department-wide implementation requires many faculty members to get training in EML methods so that they can incorporate them into their new and existing courses. The FLC's goal is to provide new instructional tools related to EML that best support the development of a faculty's teaching methods. For their “final project”, participants publish their new EML methods as a “KEEN Card” [9] that is shared with the KEEN Engineering Unleashed community.

At an R-1 institution like UNC-CH in which research is a high priority, faculty development can be a challenge. Many faculty members are focused on their research and do not have the time or training to implement new initiatives in their classes and incorporate the latest in education pedagogy [10]. However, even as faculty juggle their research and their teaching loads, most faculty have a strong desire to improve their teaching for student learning [11]. An effective faculty development program must consider these constraints and implement a strong support system to guide faculty in successfully implementing changes to their courses. The UNC KEEN

FLC accomplished this by limiting asynchronous work, providing EML implementation guides, and providing one-on-one coaching and feedback.

Methods

Overview

The FLC is led by a faculty member and staff member who have experience in engineering education and EML. The FLC's goal is to provide participants with new instructional tools that promote EML among their students. Other best practices in teaching are covered as well, such as how to write student learning objectives. Faculty are all expected to develop new activities that they can implement in their courses and publish at least one activity as a KEEN Card [9]. The KEEN Card includes instructions and resources so that faculty and instructors who use the Engineering Unleashed platform can adapt this activity for their own courses [9].

Participants

This is a year-long program, and all faculty in our department are required to participate once during the initial three years of the FLC. Other participants are faculty who are interested in EML and they are recruited from science and math departments that teach our engineering students. They are selected through an application process. In our first two years, we had 6-7 participants each year with about half from the APS department and the other half from Physics, Biology, Chemistry, and Computer Science. As an extra incentive for active participation, all faculty participants receive a $5000 stipend funded through a grant that supports this effort.

Figure 1: A typical collaborative activity during an FLC meeting.

Monthly Meetings

We designed the monthly meetings to use the same pedagogical techniques that we want faculty to implement in their courses, including active learning and opportunities for discussion and feedback. In the first year, sessions were held in a collaborative classroom using various materials (whiteboards, posters, post-its, markers, etc.) that fostered brainstorming. Because of the pandemic, the second year of FLC was implemented virtually and differently. However, the same collaborative techniques were also used, including breakout room discussions and collaborative online tools such as Mural [12].

The topics for these monthly 90-minute meetings were based on the KEEN framework and best teaching practices [7]. This includes what KEEN calls the “3C’s” of promoting curiosity, making connections, and creating value. The sessions discussed strategies for implementing and assessing the framework. There was also time for collaborative work on their “final project”, which was the development of a KEEN Card that outlines their strategy and materials for implementing EML in their class. The program concluded with an opportunity to receive feedback on their KEEN card from colleagues and students.

The sessions included other experts from our institution, who shared their knowledge and provided feedback on: assessment of EML; developing makerspace activities that promote EML; and developing activities that help students think about character and ethics. Additionally, students from our institution attended a session to provide insight and engage in discussions on student motivation [13]. These perspectives were targeted to bring relevance and significance to their KEEN Card.

The FLC aims to provide manageable tasks outside of the monthly meetings. The asynchronous work is targeted to take no more than 2 hours between each meeting. In the spring semester, the asynchronous work focuses on developing their main deliverable, the KEEN Card.

Support System

We have developed implementation guides to give participating faculty some concrete ideas for classroom activities that promote EML. Each implementation guide includes a list of five to seven strategies, ranging from small scale 10-30 minute "micro-moment" activities up to larger scale multi-week projects. The micro-moments encourage the faculty to start with a small EML classroom activity and become comfortable and confident in their abilities to lead their class in this way. During each FLC meeting, there is also an opportunity for faculty to reflect, take notes, and consider assessment techniques when implementing these strategies.

Faculty receive individual support through coaching and timely feedback from the FLC facilitators. Twice a year, a facilitator meets one-on-one with each participant. The first session is at the start of the program, and it focuses on getting to know the faculty member and their goals of the FLC. The second session is in the spring as they begin to plan their KEEN Card. The facilitator provides feedback during and outside of the FLC meetings, particularly for their asynchronous work of these small implementations and their KEEN Card plans.

Data Collection and Analysis

This study is a work in progress. A pre-and post-survey was developed to measure their knowledge of instructional practices, pedagogies, tools, and their students' in-class experiences related to the KEEN educational outcomes. These surveys include quantitative and qualitative questions. Other survey instruments are also in the process of being created for the students of these FLC participants. Data is also being analyzed from the program's faculty's deliverables, including discussion posts and their KEEN Cards. In the 2020-2021 FLC Program, participants completed one-minute papers at the end of each FLC meeting.

The verbiage of the three Cs [curiosity, connections, creating value] is something that was missing from project-based assignments that I had created years ago but which dovetailed very nicely with what KEEN is trying to accomplish. This was VERY helpful and gave me a completely new way to think about the assignments."

[The FLC] helped me retool parts of my courses to make them more engaging, and deliver content with a different mindset that is more applied than traditional classroom learning. I originally planned to apply the material to one of my classes, but will in all likelihood apply it to both of them.

"I started doing micro moments to break students up into teams to solve interesting problems by creating connections and realizing value of their connections."

Figure 2: Feedback from FLC participants

Preliminary Results

The surveys collected for the 2019-2020 and 2020-2021 FLC Programs demonstrated that the faculty gained knowledge related to the KEEN Framework and the importance of EML for their students. Example comments are shown in figure 2. Participants also reported that the program provided them with resources and techniques to construct concise exercises, and it enhanced student learning. After the first year, the program changed the curriculum, assessment, and implementation based on the feedback that we had received. As a result, in our second year, the FLC program had a greater impact on faculty participants. These results are shown in table 1.

Table 1: FLC participant average survey results (5-point Likert scale)

Instructional Practices and Pedagogies	2019-2020 FLC			2020-2021 FLC		
	Pre	Post	Change	Pre	Post	Change
Use of EML in class	3.0	3.4	+0.4	1.6	3.4	+1.8
Instructional design strategies	3.7	3.7	0	2.4	3.6	+1.2
Student motivation strategies	3.4	3.4	0	2.8	3.8	+1.0

Discussion and future work

In 2020-21, the KEEN FLC made adjustments due to the challenges of the pandemic, but also has made improvements based on feedback from the first year of the program. Over the last year, we have observed deeper discussion and more relevance for the faculty as we have modeled EML techniques in our virtual sessions. We have focused on creating a highly engaging, active environment and we will continue this focus in the future. An important addition this year was to incorporate student involvement for a discussion on motivation. Students shared their experiences on what motivates them, which provided powerful insights for faculty. We hope to add more student voices to the FLC in the future. The assessment of the FLC program is still under development. We will add additional data collection methods, including observations from the FLC Leads and their FLC peers. We will also assess the impact of EML activities on the students in classes taught by FLC participants.

The FLC is effective because it provides support for faculty members and an acknowledgement of their time constraints as they participate in the program. Faculty development programs like the KEEN FLC can be implemented on a larger scale simply through facilitation and coordination. The challenging component is providing the necessary support and coaching to individual faculty members. One instructional coach for 5-7 participants has been adequate for our FLC. See [14] for examples and activities.

Academia can be challenging and implementing a new teaching method in the time of a pandemic can almost seem impossible. But with the focus on small implementations, the limited time needed outside of the meetings for participation, and continuous coaching, the program allows for faculty members to effectively and confidently implement these EML methods.

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