SPARK-ing a Changing Pedagogy: Enhancing Pedagogy in Engineering and Beyond

P. Janelle McFeetors[1], Mijung Kim[1], Kerry Rose[1], Kristian Basaraba[1], Duncan Buchanan[1], Gillian Robinson[1], Gokce Akcayir[1], Qingna Jin[2]

[1] Faculty of Education, University of Alberta, Canada

[2] Faculty of Education, Cape Breton University, Canada

UNIVERSITY OF ALBERTA
CENTRE FOR MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION

BACKGROUND

Recent calls in higher education have specifically noted the need for faculty to consider a change from lecture-based teaching towards a more evidence-based, student-centered approach. However, studies have shown that, in many fields including engineering lecturing is still the most common instructor behaviour in undergraduate education.

This project's aim was to support higher education practitioners shifting from teacher-centered lecturing to becoming instructional designers of student-centered education.

THEORETICAL FRAMEWORK

SITUATED LEARNING

- Situated learning theory (Lave & Wenger, 1991) postulates that learning occurs as a result of socially and culturally embedded interactions and relationships, and is thus situationally (socially and culturally) dependent.
- This is congruent with the theoretical conceptualization of signature pedagogies within pedagogical knowledge domain as learning is seen as a social process of enculturation.

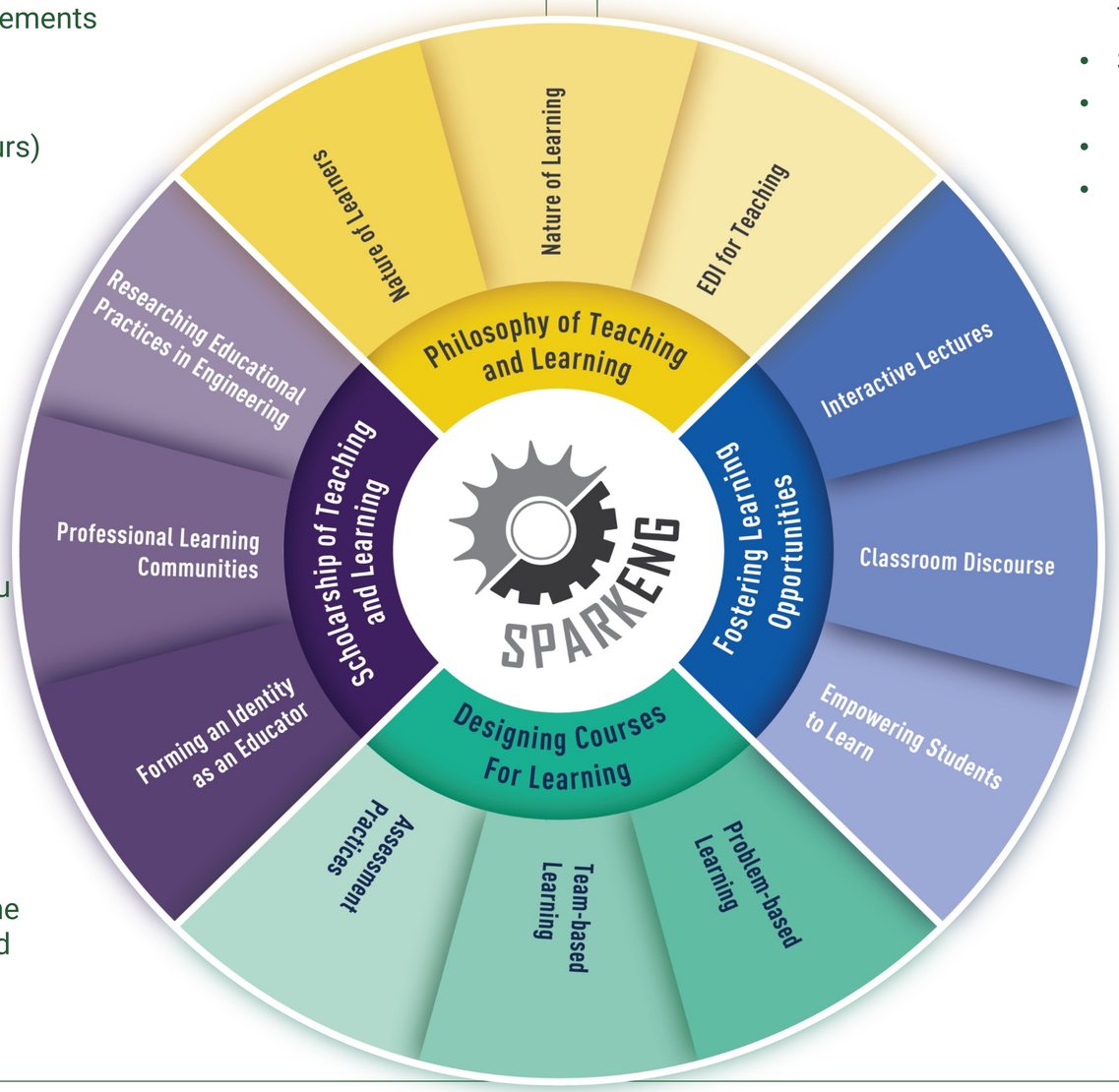
SPARK-ENG Profs

Scholarship of Pedagogy and Application of Research Knowledge in Engineering (SPARK-ENG) for Professors:

- Discipline specific content for Engineering Profs
- Synchronous & asynchronous elements
- Cohort-based
- Implement over 2 years
- Each module is 3 weeks (~9 hours)
- Led by an instructional coach

Quotes from the participants:

- "I've taken many kind of education or teaching based training, not only in this university, like the one he [the instructional coach] is giving right now is the best."
- "I wish there was a way to get the whole faculty involved in this kind of thing. Like you know, in terms of improving our engineering education, we could set ourselves apart as leaders in all of the schools in Canada for engineering by doing this well. "
- "I used to think I could teach, but I think going through just these few months with the, in the SPARK-ENG programme, I think has given me a whole new perspective on the possibilities, things I can do, things I can add and how I can face challenges. "



SPARK-ENG TAs

Scholarship of Pedagogy and Application of Research Knowledge in Engineering (SPARK-ENG) for Teaching Assistants:

- Discipline specific content adapted according to TA role and identity
- Synchronous & asynchronous elements
- Implement over a term; 12 weeks
- Each module is a week (~3 hours)
- Led by an instructional coach

Quotes from the participants:

- "I had some vague ideas about teaching even before I take [sic] this program, but this program helped kind of shape my specific ideas about all these."
- "At the time I used my intuition and some sort of my experience to teach complicated matters to students. And after attending this course I found out that there is some sort of strategic ways."
- "Before that [the program] everything was like a trial and error, you teach some courses, you get some feedback from the students, … but this course provides this amazing opportunity to learn about everything, without having the pressure of actually teaching anything."

CRÉER-CSJ

Comprendre la recherche éducative pour un enseignement réussi - Campus Saint-Jean (CRÉER - CSJ) for Professors and Academic Teaching Staff:

- Two discipline-specific streams (Natural Sciences and Social Sciences and Humanities)
- Synchronous & asynchronous elements
- Cohort-based
- Implement over 2 years
- Each module is 3 weeks (~9 hours)
- Led by an instructional coach

Impressions of the Instructional Coach:

"The CRÉER-CSJ program is distinct in its use of multidisciplinary cohorts to support the participants in their pedagogy. This community of practice model requires educators to reflect deeply on the approaches to learning in their own context through the perspectives and experiences of their colleagues in other disciplines. This also means that many participants themselves are experts in educational research. Still, the cohort model allows for the critical discussion space needed to catalyze expertise along with the support of the modular themes. The design of this program has meant many experienced educators feel that their practice is becoming more aligned with their teaching philosophy."