

Special Session - Communities in Practice in Engineering Education: What Are We Learning?

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Abstract – Engineering education research crosses multiple disciplines and as such there are no discrete or clear guidelines. Rather, it is evolving through practice – and the community is at a point in time where dialogue and community building are important next steps for advancing engineering education scholarship. The goal of this interactive session is to make visible and shared what we as a community are learning – a form of knowledge that has typically been outside the realm of formal presentations and publications. We will do this by creating an interactive *knowledge creating community of practice* forum on challenges of engaging in engineering education research and strategies for success. To anchor the forum, we will draw on the shared experiences of engineering faculty and graduate students who participated in a year long engineering education research program, the Institute for Scholarship on Engineering Education (ISEE).

Index Terms – Building capacity in engineering education communities of practice, narratives

INTRODUCTION

The engineering education community has experienced the launching of new programs that provide formal pathways for advancing the scholarship of engineering education. These include year long guided research experiences, schools of engineering education, interactive workshops on research methods, and forums for disseminating knowledge such as recent changes to the *Journal of Engineering Education*. These programs extend and enhance what has been occurring naturally during more informal experiences such as hallway conversations, luncheons, and those moments after meetings or conference presentations. What have been lacking are opportunities to bring together these rich formal and informal learning experiences to engage as a *community of practice*. Communities of practice foster learning and professional development by providing access to roles that encourage learning and membership in a community, cultivating and practicing leadership, and building collaborative knowledge in which individual experiences become communal, distributed

expertise can be shared, and standards of practice can evolve [1-4].

GOALS OF SESSION

The goal of this session is to contribute to the advancement of engineering education scholarship by making visible and shared knowledge that has typically been outside the realm of formal presentations and publications. We will create an interactive *knowledge creating community of practice* forum on challenges of engaging in engineering education research and strategies for success. These include such challenges as designing and conducting research (e.g., “what makes a good research question, and what methods should I consider?”), building community (e.g., “how can I impact local change on my campus, and who can I collaborate with?”), designing effective learning environments (e.g., “now that I have a better understanding of my students, now what?”), bridging engineering and education disciplines (e.g., “what counts as evidence in education research – is it the same or different?”), and effectively communicating research (e.g., “how can I use this to get the support of my department chair to improve our program?”).

To anchor the session, we will draw on shared experiences during the 2004 Institute for Scholarship on Engineering Education (ISEE) in which 17 Scholars (12 engineering faculty and 5 graduate students) from Howard University, NCA&T, Purdue University, Stanford University and the University of Washington conducted year-long studies on engineering learning and teaching. We envision a two-way exchange of ideas – drawing on our own lessons learned and eliciting lessons learned from our audience members – to make visible and shared what we as a community are learning. As such, we anticipate learning gains for both audience members and session presenters including how to build a community of practice, and awareness of common challenges in engineering education scholarship and practical ways to navigate these challenges.

SESSION CONTENT AND AGENDA

This 120-minute session will include four activity periods and conclude with a final reflection summarizing the outcomes of this session. The session begins with a calibration activity to assess the scale and scope of existing knowledge and

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SUMMARY

familiarize participants with the interactive format of this session. This will be followed by a description of session goals and activities. In the second phase we will use the ISEE Scholars' experiences as a jumping off point to elicit the experiences of others. A key mechanism for this will be narrative posters that illustrate the behind the scene stories of navigating the challenges of engineering education research. In the third phase the goal is to make explicit the lessons learned during the narrative poster session and capturing these on a "community data wall". The final phase will include a debrief and summary that links back to the first phase to illustrate what we accomplished as a group.

ANTICIPATED AUDIENCE

Based on previous experience (both attending and presenting interactive sessions at FIE) there is high interest in sessions designed to facilitate engineering education scholarship. As yet, none have taken advantage of focusing the content of the session on what we as a community are learning about such endeavors. We feel the time is ripe and that many would seek out the opportunity. This would include people who want to conduct research, build community (locally and nationally), collaborate or network, better understand their students, and reflect on improving their teaching. For example, we anticipate that novice researchers may be interested in learning about ways to get started and strategies for overcoming common stumbling blocks. More experienced researchers may want to examine how engineering education is evolving as a profession. Those interested in creating or supporting programs to advance the scholarship may want to assess the needs of the community to design or improve programs. As a community of practice forum, it would be important to engage all these differences in skills and perspectives.

SESSION OUTCOMES AND FUTURE OPPORTUNITIES

The goal of this session is to advance engineering education by 1) creating collaborative knowledge that can move the profession forward, 2) fostering learning and professional development, 3) building and strengthening networks, and 4) facilitating greater coherence within the community. A physical outcome generated through our community of practice forum will be an archive (the "data wall") of collective knowledge about challenges and strategies for engaging in engineering education scholarship. Participants and presenters will also leave the session with a sense of accomplishment for having contributed to where the community has been and where it is going, as well as better prepared to undertake their own work and better connected to the community as a whole.

Looking towards the future, we hope to use the outcomes of this session to guide future efforts for advancing engineering education scholarship. These may include improvements to our next Institute or the design of future interactive sessions or perhaps the generation of a special interest group on communities of practice in engineering education scholarship.

Engineering education research crosses multiple disciplines and as such there are no clear guidelines. Rather, it is evolving through practice – and the community is at a point in time where dialogue and community building are important next steps. A community of practice forum is best served in an interactive format where activities are designed to elicit knowledge and create shared understanding. Similarly, narratives (such as our interactive posters) are an effective tool for creating spaces for crucial dialogue. Using a variety of interaction formats provides multiple pathways and entrance points to engage all participants – participants that may vary widely in their existing knowledge and skills. Finally, the focus of this session provides an opportunity to make concrete and visible knowledge that is rarely made public and shared.

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