Special Session – Communities of Practice in Engineering Education: How Do We Investigate Diversity and Global Engineering?

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Abstract – In today’s context, we are all challenged to consider issues of diversity and global engineering in the context of engineering education. However, little explicit guidance has been given on how to conceptualize diversity and global engineering in meaningful ways, and how to develop research questions that allow us to rigorously investigate the issues at hand. This session will provide an interactive forum for exploring those questions, finding answers collaboratively, and moving one’s own work forward. To anchor the forum, we will draw on the 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). The session will build on a similar session offered at the 2005 FIE conference to expand the growing engineering education research community, extend the knowledge-generating work begun in the 2005 session, and add two new components: 1) a focus on the process of developing and refining a research question, and 2) an emphasis on studying diversity and global engineering issues.

Index Terms – Communities of practice, investigating diversity, research study design.

INTRODUCTION

The community of scholars doing rigorous engineering education research has grown in recent years, in part due to efforts such as workshops on research methods and year-long guided research experiences, which have provided significant opportunities for new and experienced investigators to engage in communities of practice [1]. These efforts and the resulting advances in engineering education research are significant, but there remains more work to be done in this area. Although the growing communities of practice have facilitated the entry of many into the educational research arena, what is often lacking is explicit guidance on specific steps in conducting appropriate studies. In particular, many new researchers are looking for guidance on taking the first steps in the process: narrowing down a research interest and formulating a viable research question [2]. In today’s context, we are all challenged to consider issues of diversity and global engineering. This challenge has been disseminated widely in reports such as The Engineer of 2020 [3] and Educating the Engineer of 2020 [4], and has resulted in organized efforts to address these issues, such as the “Women in Engineering,” “Minorities in Engineering,” and “International” divisions of ASEE. But in practical terms, how do we take this enormous concern and narrow it down to a manageable research topic? In other words, how do we conceptualize diversity and global engineering in meaningful ways, and then how do we develop research questions that allow us to rigorously investigate the issues at hand? This session will provide a forum for exploring those questions, finding answers collaboratively, and moving one’s own work forward.

This session builds upon an interactive session design presented by the first and last authors at the 2005 FIE conference, entitled “Communities in Practice in Engineering Education: What Are We Learning?”[5]. In that session, participants in the 2004 Institute for Scholarship on Engineering Education (ISEE) shared their stories about doing engineering education research and engaged in knowledge exchanges with session attendees. These exchanges fostered the creation of a community of practice around engineering education research. The current session will use a similar format to build upon the lessons learned, extend the shared knowledge, expand the community, and add new components.

GOALS OF SESSION

The underlying goal of this session is to advance engineering education scholarship by making visible the experience of conducting engineering education research, particularly research around issues of diversity and global engineering. This session will use the model of our 2005 session as a jumping off point to the next step. The session will expand the growing engineering education research community, extend the knowledge-generating work begun in our 2005 session, and add two new components: 1) a focus on the

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process of developing and refining a research question, and 2) an emphasis on studying diversity and global engineering issues. Our specific goals for this session are to:

- make visible the experience of doing engineering education research;
- make explicit the process of developing and refining a research question;
- highlight ways of doing the above specifically around issues of diversity; and
- help participants in this community move their own research forward by providing concrete advice, support and feedback as they construct viable research questions.

In order to meet these goals, we will draw on the experiences of participants in the 2006 ISEE, in which 18 Scholars from around the country conducted year-long studies on diversity and global issues in engineering teaching and learning. A two-way exchange of ideas is expected, sharing our lessons learned and eliciting the experiences of session attendees.

SESSION CONTENT AND AGENDA

This 90-minute session will include four activity periods, including a final reflection summarizing the outcomes of the session. The session will begin with a calibration activity to assess existing knowledge and familiarize participants with the interactive format of this session, followed by a description of session goals and activities. The second phase will introduce narrative posters that illustrate the ISEE Scholars’ stories of navigating the challenges of engineering education research. In particular, the narratives will make visible the process of developing and refining research questions around issues of diversity and the global engineer. Interaction and sharing of stories among session attendees and presenters will be encouraged. The third phase will consist of concurrent small group elicitation and a mini-workshop on research question development. In the small groups, session attendees will have the opportunity to work on refining their own research question ideas and receive feedback. The final phase will include a debriefing and summary that links back to the first phase to illustrate what we accomplished as a group.

ANTICIPATED AUDIENCE

Based on previous experiences at FIE conferences, there seems to be a high interest in sessions designed to facilitate engineering education scholarship. Especially given this session’s focus on studying issues of diversity and global engineering, we feel that many conference attendees would seek out the opportunity to participate in such a session. This would include people who want to conduct research, build community, collaborate or network, better understand their students, and reflect on improving their teaching. In particular, those who are concerned about issues of diversity on their campuses and are looking for ways to investigate those issues would find this session informative. This session will be useful for people who are new to this type of research, and also those who are actively doing this type of work and are looking for support and feedback from a like-minded community as they move their work to the next phase.

SESSION OUTCOMES AND FUTURE OPPORTUNITIES

We anticipate that session participants will gain knowledge about conducting engineering education research, become more connected to the engineering education research community, and leave the session with concrete tools to move their own research forward. Looking toward the future, we hope to use the outcomes of this session to guide future efforts for advancing engineering education scholarship. We also hope to see the continued growth of communities of practice of scholars engaged in engineering education research, particularly around issues of diversity and global engineering.

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REFERENCES