Special Session - Linking Research Findings on Engineering Student Learning and Engineering Teaching: Implications for Engineering Education

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Abstract - The goal of this special interactive session is to engage attendees in (1) knitting the results of two linked studies (of engineering undergraduates and engineering faculty) into the larger body of engineering education scholarship and (2) developing ways of thinking about these findings that can be used to inform engineering education program planning and classroom practice. The findings are from an extensive set of data collected over multiple years by the Academic Pathways Study (APS) and Studies of Engineering Educator Decisions (SEED), both of which are part of the NSF-funded Center for the Advancement of Engineering Education (CAEE). These data sets present a unique opportunity to examine the intersections between research on engineering learning from the student perspective and research on engineering teaching from the faculty perspective. The expected audience for this session would be engineering education researchers, engineering educators, faculty development practitioners, engineering curriculum developers, and policy makers. The session is designed to engage attendees in (1) knitting the APS and SEED results into a larger body of engineering education scholarship, and (2) developing ways of thinking about these findings that can inform engineering education program planning and classroom practice.

The CAEE team will use a successful interactive format previously used by CAEE researchers at the 2005 and 2007 FIE Conferences. This 90-minute special session will include two activity periods and conclude with a final discussion and reflection period.

SESSION CONTENT AND AGENDA

Part I (30 minutes) – Introduction. Members of the research team will present a brief overview of the Academic Pathways Study and the Studies of Engineering Educator Decisions, and provide an outline of the activities included in the special session and instructions for audience participants. This will be followed by a presentation of research results in slide-show format that summarize various major findings from the studies, relying on data from a variety of methods. Audience participants will be given copies of the slides, summaries of the findings, and be invited to ask questions of the APS and SEED researchers during and after the presentations. Participants will be provided with note paper and encouraged to write down their reactions to the data, guided by the following questions:

- What other research findings do these remind you of? What other research might be informed by this research, and vice versa?

GOALS OF THE SESSION

The goals of this special interactive session are to 1) present findings from an extensive data set from the APS and SEED studies of the CAEE and 2) engage attendees in discussion of these results with respect to engineering education program planning and classroom practice in the framework of engineering education scholarship. These data sets present a unique opportunity to examine the intersections between research on engineering learning from the student perspective and research on engineering teaching from the faculty perspective. The expected audience for this session would be engineering education researchers, engineering educators, faculty development practitioners, engineering curriculum developers, and policy makers. The session is designed to engage attendees in (1) knitting the APS and SEED results into a larger body of engineering education scholarship, and (2) developing ways of thinking about these findings that can inform engineering education program planning and classroom practice.

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- What other research findings do these remind you of? What other research might be informed by this research, and vice versa?
• In what ways might teaching, curricula, and/or engineering programs be improved, knowing what we know now?

Part II (40 minutes) – Concurrent small-group discussions. Audience participants will divide themselves into small groups broadly defined by two interest areas: (1) engineering education researchers and (2) engineering educators. Group members will participate in interactive small group discussion facilitated by APS and/or SEED researchers.

• Researcher group: The research group will be asked to discuss the findings in light of other strands of engineering education research, including their own research projects. The purpose of this discussion is to weave APS and SEED findings into the larger body of engineering education scholarship by identifying possibilities for further research, opportunities for research collaboration, and other potential scholarship activities.

• Educator group: The educator group will be asked to discuss the findings in light of what currently occurs in the engineering classroom, and what could occur. A key question will be: what teaching practices and instructional designs are suggested and supported by the APS and SEED findings? The purpose of the discussion in this small group is to better inform the engineering classroom.

Part III (20 minutes) – Debriefing and reflection. The audience participants will be called together and a representative from each small group will report on their group’s discussion. The full group of participants and facilitators will discuss possible next steps for researchers, educators, and policy makers.

SUMMARY

The session is designed around an approach shown to be effective for sharing and constructing knowledge, and ultimately situating various perspectives within an engineering education community of scholarship and practice. This interactive session will help familiarize the audience with CAEE results in the broader context of engineering education research and aid the CAEE team in integrating the findings from the APS and SEED into the larger body of engineering education research.

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REFERENCES


