145c Quantifying and Characterizing Active Learning in the Research Communications Studio Model

Michael A. Matthews, Chris Long, Lori Donath, Roxanne Spray, Nancy Thompson, and Elisabeth Alford

The benefits of active learning in the traditional classroom setting are well established among engineering educators. However, little has been done to describe the interpersonal dynamics that characterizes this learning model outside of the classroom. This work considers teaching and learning in a research group setting in which the focus is on the undergraduatestudent. The Research Communications Studio (RCS), an environment of distributed cognition, has been structured to promote active learning among undergraduate researchers working in small groups. The presence of active learning is measured by considering participation levels, rates of exchange of information, as well as conversation alignments. The findings show that the activity level in the RCS is quite distinct from that expected in the classroom.

Furthermore, the processes through which multiple dimensions of learning occur within a network of distributed cognition are under investigation. The present study identifies seven speech events that characterize linguistic processes of distributed cognition among undergraduate researchers. Analysis of a small group session at the RCS revealed that participants enact critique, elicitation of critique, internalization, (direct and indirect) instruction, contextualization, explanation, and collaborative negotiation of knowledge throughout their interactions. Awareness of these speech events, which emerged from the analysis, may better equip engineering educators to optimize interactions in other active group learning environments and to facilitate such activities in more traditional pedagogical settings.