The reader will note that ell 3 is empty. Note also that students with propensities □ and □ used many strategies for managing uncertainty. Students with propensities □, □, and □ used few strategies. Those in ell □ not only made frequent use of many strategies, but also tended to draw from a diverse range of strategies that included ignoring, reducing, and maintaining uncertainty.

Students with propensities □, □, and □ tended not to acknowledge uncertainty, whereas students with propensities □ and □ did. For example, Satya’s willingness to take up uncertainty was exhibited when she responded to an announcement that Kisha and Becky had dismantled the trailer the group had labored on for days, intending to make a robo-claw instead. Satya was visibly upset by the decision her group members’ made without her. Yet, even while being thrown off-kilter by the change of design, Satya rather quickly surrendered her commitment to her past work, distracted by the new set of problems.

Satya: But is it going to be able to move, go like this and then go like this?
Kisha: I don’t know.
Satya: But if it doesn’t do that we just/
Kisha: //Oh, yeah, it has a motor. //Yeah, it should, yeah.
Satya: No, it needs two motors then, right. It needs to be able to move//go like this and then move this way like this.
Kisha: It should be.
Satya: //you’re sure, //you’re sure
Kisha: I’m //sure.
Satya: Well then…
Satya: I’m going to cry. Wait, how many motors does it need?

Satya’s response could have been to be quite certain that the new idea would not work. Instead, she was willing and able to entertain uncertainty about the situation in which she found herself.

**Significance**

Students brought with them to the collaborative engineering setting tendencies for managing uncertainty that had developed through experience, their habits and histories of participation in prior groups. The students all used a range of strategies, but at the same time they had individually identifiable patterns of uncertainty management. Some students had many ways to manage uncertainty; some students had only a few ways. Some students easily acknowledged uncertainty; others seemed to resist taking up uncertainty when uncertainty seemed warranted to one or more of their group members, to their teacher, or to me as an observer.

Although the number of participants from this study is too small to make generalizations, it is interesting that the three students in the category “an somebody help me” were female and that all three student in the category “ate me uncertain” were male. Since previous research has noted that the expression of uncertainty can vary by gender and socioeconomic status (see, □□□□), future studies need to explore the association between these characteristics and uncertainty propensities. Future research should also examine how propensities for managing uncertainty in collaborative environments are related to learning and achievement.

Much of the research on uncertainty management has conceived of it as an individual level of analysis; however, some see uncertainty management as a social issue (□□□□ □□□□). A majority of activities students are likely to face as adults are collaborative tasks, and most of the learning they do will be of a social nature (Bruner, □□□□). For most individuals most of the time, the primary resource they have is each other, whether in face-to-face or virtual interaction. Thus, how one manages uncertainty in a collaborative context is important. Given the central position of relationships in determining how social systems emerge and unfold (Arrow, □□□□ □□□□), it is likely that the nature of interdependencies and interactions within a collaborative peer group will influence the ways individuals in that group manage uncertainty (□□□□ □□□□, under review) and that the propensities of individual group members will likewise influence the quality of interactions in the group. The study described here contributes to understanding of these issues.

If uncertainty is required for learning and is a ubiquitous experience in collaborative learning contexts, then it behooves educational researchers to understand how students manage uncertainty and ways in which the interaction among students with different propensities influences the quality of peer collaboration. Doing so could allow us to identify instructional strategies for helping students increase their range of strategies, willingness to acknowledge uncertainty, and abilities to recognize when different strategies are appropriate.

**References**


