THAT'S NICE…BUT IS IT WORTH SHARING?

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Introduction

Productive groupwork requires "group-worthy" problems (cf. Complex Instruction; Featherstone et al., 2011), which are nontrivial, require multiple competencies, and often have multiple solution paths (see also "problem aesthetic"; Schoenfeld, 1991). In contrast, groupwork with standard tasks often degenerates into one student "teaching" the other, because the tasks do not support collaborative learning. Short of full-blown collaborative groupwork, partner work is often a productive practice. In this poster, I discuss a particular type of partner work (peer-assessment) and the affordances required of tasks to make the activity productive. I dub these problems "peer-worthy." Peer-worthy problems should satisfy a number of the following criteria; they: (1) are nontrivial, (2) have multiple solution paths, (3) require students to generate examples, and (4) involve explanation. In short, peer-worthy problems require students to generate mathematics in problem situations that allow for many different productive pathways, allowing students to deepen their understanding by making connections.

Method

Students engaged in a peer-assessment activity as a part of their undergraduate calculus course (Reinholz, 2013). Students: (1) solved a weekly homework problem, (2) self-assessed their understanding, (3) traded their work with a partner and performed a peer-assessment, and (4) revised their work based on peer-feedback. I performed microgenetic analyses of student interactions (cf. Schoenfeld, Smith, & Arcavi, 1991), and for this poster I contrast student interactions working on two different problems – one peer-worthy problem and one "unworthy" problem. The peer-worthy problem required students to determine whether a number of statements were always, sometimes, or never true, and provide an explanation or appropriate examples. The comparison problem was a standard related rates problem.

Results, Analysis, and Conclusions

Students discussed the peer-worthy problem by comparing and contrasting various examples, attempting to determine if they actually met the criteria required by the problem. By engaging in the peer-assessment activity, students actually revised and reconsidered their understandings of the problem. In contrast, conversations of the related-rates problem were mostly focused on how to properly differentiate the functions involved, and had little connection to problem solving or deep mathematics. While students did find errors in differentiation, the interactions did little to alter students' understandings beyond a procedural level.

Partner work provides students with a number of opportunities for productive engagement and learning. Peer-worthy tasks require students to bring their various mathematical perspectives to the table, which allows them to make connections between these various viewpoints and develop deeper understandings. This is in contrast to many standard tasks, which are better suited for supporting individual, rather than collaborative, learning.

References

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