

May, 2009 –

Faculty Development Tidbit: Why Group Work Improves Problem-Solving Abilities

Problem solving in a group slows down the process. It forces student to be more thoughtful or, more precisely, as the educational psychologists would point out, it promotes metacognition. Now students have to explain to others why they think a particular action should be taken and what they anticipate will happen as a result of that action. Guessing or glossing over the details doesn't hold up when there are competing explanations or others to be convinced.

Researchers have identified three aspects of these explanations, each of which has the potential to develop problem-solving skills:

- First, when the student explains why, that explanation may help others learn. Sometimes a student can actually help another student understand better than the teacher can. Students who have just learned something remember the way into that understanding, whereas teachers who've known and used the knowledge for years forget what it looked like when they first confronted it.
- Next, the problem may be solved in a group by co-construction. Students elaborate and otherwise build on each other's answers, creating a solution collectively. The process may involve controversy and critique, but again it is a process that causes students to engage and think more deeply about the problem and its solution.
- Finally, there is the benefit of self-explanation. Ideas often exist in amorphous forms. They may make sense. They may even be right but the student may not understand why. When an idea must be articulated, either spoken or written, it is made concrete, and that tangible form makes it much easier to see and to understand if and how the original idea hangs together. Said simply, students understand something better when they say it.

Ref: Cooper, M.M., Cox, Jr., C.T., Nammouz, M., and Case, E. (2008). "An assessment of the effect of collaborative groups on students' problem-solving strategies and abilities." *Journal of Chemical Education*, 85 (6), 866-872 as reported in "The Teaching Professor," Volume 23, Number 5, May 2009