

# Competition, Education, and the Scientific Method

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Many years ago, I was invited by Bob Ridkey to travel to Washington to sit on a National Science Foundation CCLI panel. The chance to meet such a well respected advocate of Geoscience Education was a great thrill, as was the chance to interact with other faculty from across the country. While many aspects of the discussions and decisions that occurred during that weekend are lost to my memory, there is one event that has continued to stand out for me throughout the ensuing years. One of the grant applications considered by the panel described an upper division environmental geology course that simulated the business world by pitting teams of students against each other in the development of proposals for remediation projects designed by the instructor. Team proposals were assessed based upon the quality of the science as well as the quality of the presentation with the best proposal "winning" the contract.

During the panel discussion of the grant application I noted to the group that some of my best learning experiences as an undergraduate occurred when there was an element of competition to the exercise. I was immediately taken to task by another panel member concerning the value of competition in learning, especially as it relates to differences in the ways in which males and females learn. I have often reflected on that rather heated conversation as I have considered how to maximize student learning.

Without question competition is a major component of the academic world. Faculty positions are filled on a competitive basis, manuscripts compete for space in academic journals, and of course funding agencies run

competitions for the distribution of support, such as the NSF panel I described above. In all of these examples the underlying cause of competition is scarcity in resources. There are only a handful of faculty positions in each discipline available each year; there are cost and quality concerns that limit the number of pages a Journal can publish; funding agencies have limited budgets to support the many worthy projects that are proposed.

Scarcity, however, does not exist in knowledge. There are no external limits to what an individual can learn. Rather, we are bound only by our innate ability and effort. Additionally, the spirit of the scientific method is one of the free sharing of new knowledge. Scientists working collaboratively have advanced the human understanding of our universe at an astonishing rate. How then does the educator best reconcile these conflicting aspects of the academic enterprise?

I believe, as educators, we are obligated to expose our students to the collaborative and competitive aspects of both the academic and "real" business world. Teambuilding and collaborative learning strategies have proven to be highly successful pedagogical techniques at all levels of instruction. Competition, conversely, is perhaps best employed only in advanced courses where students have achieved a level of personal and professional maturity. I encourage educators to present results of their efforts to incorporate competition into their classrooms. How were competitive exercises developed, how was student learning assessed, how did students with "non-competitive" natures respond to the exercise? When and where is competition good in education?

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