

MAR14-2013-020289

Abstract for an Invited Paper  
for the MAR14 Meeting of  
the American Physical Society

**Capitalizing on Community: the Small College Environment and the Development of Researchers<sup>1</sup>**

M.R. STONEKING<sup>2</sup>, Department of Physics, Lawrence University, Appleton, WI 54911

Liberal arts colleges constitute an important source of and training ground for future scientists. At Lawrence University, we take advantage of our small college environment to prepare physics students for research careers by complementing content acquisition with skill development and project experience distributed throughout the curriculum *and* with co-curricular elements that are tied to our close-knit supportive physics community. Small classes and frequent contact between physics majors and faculty members offer opportunities for regular and detailed feedback on the development of research relevant skills such as laboratory record-keeping, data analysis, electronic circuit design, computational programming, experimental design and modification, and scientific communication. Part of our approach is to balance collaborative group work on small projects (such as Arduino-based electronics projects and optical design challenges) *with* independent work (on, for example, advanced laboratory experimental extensions and senior capstone projects). Communal spaces and specialized facilities (experimental and computational) *and* active on-campus research programs attract eager students to the program, establish a community-based atmosphere, provide unique opportunities for the development of research aptitude, and offer opportunities for genuine contribution to a research program. Recently, we have also been encouraging *innovative* tendencies in physics majors through intentional efforts to develop personal characteristics, encouraging students to become more *tolerant of ambiguity, risk-taking, initiative-seeking, and articulate*. Indicators of the success of our approach include the roughly ten physics majors who graduate each year and our program's high ranking among institutions whose graduates go on to receive the Ph.D. in physics.

<sup>1</sup>Work supported in part by the National Science Foundation.

<sup>2</sup>Work done in collaboration with J.A. Collett, M.K. Pickett, D.S. Martin, J.R. Brandenberger, and D.M. Cook.