

Authentic Practice and Discourse of Science: From the Classroom to the Research Lab

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Undergraduate life science majors often have little opportunity to develop an appreciation for the authentic practice and discourse of science. In addition, research opportunities for undergraduate students may be limited, and students going into independent research laboratories are often unprepared. Based on these problems, which seem to be inherent to traditional undergraduate research experiences, we designed an alternative model, the “Research PackTrack (RP) Program,” that provides research training experiences for freshmen and sophomore students. Our rationale includes the need to get students actively involved in research gradually and early on so they can engage in authentic scientific practice, overcome their apprehension about scientific research, and build a solid foundation for becoming researchers. It calls for retaining women and other minorities, who learn best in collaborative settings with problem-based approaches. Our program is anchored in a two-semester experience, starting with second semester freshmen, that scaffolds students’ understanding in evaluation of primary literature; organization, representation and interpretation of data; experimental design; database searches; scientific writing and oral presentations; peer review; and ethical issues. The second course, taught in a fully operational research lab, allows first semester sophomores the opportunity to work cooperatively, manage lab experiments, and produce meaningful data that they can present at research symposia or publish. Unlike “cook-book” laboratory experiments, students learn how a research lab operates as they move from guided to independent research studies. Students can then continue on with their research during subsequent semesters and mentor incoming students or they can progress to an independent research laboratory.

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