Sustainable Development Research in the Classroom: An Early Start

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Abstract

Scientific literacy is often viewed as beneficial to a workforce dealing with an ever-changing world dominated by science and technology. The earlier learners encounter science, the argument goes, the better equipped they will be to solve the problems that such a world may present. Yet, scientific literacy, a key learning outcome of undergraduate education, is particularly challenging for non-STEM students with a didactic instructional background. Their past educational experiences have led them to adopt a passive approach to course materials, which may put them at a disadvantage with STEM students. In the present study, we asked whether introducing research practice early in the undergraduate general education curriculum could promote the attainment of learning outcomes covering scientific literacy in non-STEM students. A first-year communication course devoted to scientific literacy, offered by an English-medium university in the Middle East, was selected. The instructional method adopted to organize course activities was guided inquiry-based learning, which was intended to foster a sense of agency as well as a collaborative and supportive environment. At midterm, non-STEM students' scientific literacy was estimated to be below that of STEM students. Also, resistance to inquiry-based learning was more often expressed by non-STEM students. At the end of the semester, the scientific literacy of these two groups of students no longer differed. It was concluded that guided inquiry-based learning is an effective method for allowing non-STEM students to overcome past disadvantages in their exposure to science. Its ability to promote a sense of agency through problem-solving activities in a supportive environment may be primarily responsible for this outcome. Individual differences, however, existed, including non-STEM students' greater acquiescence to this instructional method's high cognitive demands than endorsement of its mode of learning.

Keywords

General education, research practice, inquiry-based learning instruction, freshman students, scientific writing.