

Foregrounding Critical Thinking in Communication Courses for Engineering Students

Caroline Brandt

Petroleum Institute, United Arab Emirates

ABSTRACT

This paper reports on research completed at a degree-awarding engineering institute accredited by the US Accreditation Board for Engineering and Technology (ABET) in the United Arab Emirates.

In first-year communication programs, ABET Student Outcome 3i, “recognition of the need for, and an ability to engage in life-long learning” is supported in part by a learning objective that aims to develop students’ ability to “demonstrate reflective and critical thinking skills”. While this objective is supported throughout the institute’s engineering curricula, many students first encounter the associated concepts and skills in their freshman year, primarily during the first communication course. Program review found that while instruction aimed at developing students’ critical thinking skills is well integrated in the curriculum, and it appears that many students begin to develop the necessary skills successfully, limited means existed for tracking individual students’ specific progress, which is an ABET requirement.

Addressing this, informed by a meta-analysis of research in which key critical thinking skills for freshmen were identified, the researchers developed a series of interventions designed to foreground critical thinking in the curriculum and provide holistic evidence of the extent to which students successfully develop skills as a result of instruction. Intervention design was informed by the need for evidence that: a) can be used to infer the degree to which the student has met the learning objective; b) is longitudinally comparable; c) results from a variety of instruments; and d) is transparent and valid.

Drawing on the results of administering the interventions to over 240 freshmen, student progress is discussed and intervention effectiveness in facilitating tracking is evaluated. Various linguistic and cultural issues arising from the interventions are outlined, and several unanticipated benefits are explored. The paper concludes with a consideration of the extent to which the intervention may be transferable to other discipline contexts.