Self-development Courses for Dealing with the Transitions

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ABSTRACT

Two existing academic and professional development courses have been redesigned to help chemical engineering students deal proactively with two transitions: from secondary school to university and from university to the workplace. Both use the Myers-Briggs Type Indicator as a conceptual framework and include many reflective exercises to encourage students to become self-regulated learners. An attempt has also been made to build learning communities by integrating the first course with the department's mentoring program.

Keywords

Self-regulated learning, academic development, professional development, career management, Myers-Briggs type indicator

BACKGROUND

An engineering education has always emphasized the importance of non-technical competencies and skills. This fact is clearly evident in the "Engineering Criteria (EC) 2000" established by the Accreditation Board for Engineering and Technology (ABET) in the United States. Besides technical knowledge and skills, ABET explicitly lists other skill and affective outcomes such as the ability to communicate, to work on multidisciplinary teams, and to engage in lifelong learning as the hallmarks of a good engineering education.[(1)]

The perennial challenge engineering educators face is achieving this within the constraints of a technically-oriented curriculum. The situation is even more difficult in Hong Kong, where the normal length of an engineering degree is three years. To address this issue, the School of Engineering at The Hong Kong University of Science and Technology has made provisions for its departments to introduce into the curriculum courses specifically targeted at students' academic and professional development. In response the Department of Chemical Engineering has introduced two such courses, CENG001 and CENG002.

Since fall 2005, a coherent conceptual framework has been developed in these two courses for students to acquire skill and affective outcomes in a systematic manner. To date, the newly designed CENG001 has been offered three times; CENG002, twice. About 300 chemical engineering students have taken these courses, including every student who is currently in the department.

In this paper I will describe briefly the courses' content and delivery, summarize the students' feedback, and identify challenges and opportunities that lie ahead.

THE COURSES

These two courses are positioned to serve as "bookends" to the overall university experience. In particular, their main purpose is to help students deal with two difficult transitions: in CENG001, it is from secondary school to university and in CENG002, from university to the workplace. As such CENG001 focuses on academic development and CENG002, on professional development, even though the two are by necessity interlinked (for example, how students deal with the first transition will impact on the second).

CENG001, offered to first-year students in the fall semester, focuses on the academic and social adjustment issues commonly faced by new university students. Topics include the purposes of university and engineering education, learning, time management, teamwork, communication and interpersonal skills, and goals setting.

CENG002, offered to third-year students in the fall semester, focuses on career management as a lifelong process. Students are given the opportunity to systematically reflect on their values, skills, values and personality and, on the basis of this, develop personal and professional goals. The course also provides practical advice on writing résumé and preparing for interviews.

Common to both courses is the intended learning outcome that students become self-regulated, lifelong learners. To this end the Myers-Briggs Type Indicator (MBTI), a widely used and researched instrument[(2)], is adopted for students to gain a better self-understanding. They are asked to conduct an online assessment, attend a debriefing session, and read "Introduction to Type"[(3)] to verify their MBTI types. Afterwards students learn about the strengths and blind spots of each type in situations such as participating in teamwork, resolving conflicts, and communicating with people. MBTI provides a useful tool for them to monitor their behavior and identify areas for improvement, which is important for self-regulation.

As the key to self development rests on a better understanding of oneself, students in both courses are asked to participate in reflective activities in class, either individually or in small groups. These promote active and collaborative learning, which is particularly important to students in CENG001 as such experience may be new to them. Furthermore, students in CENG001 are asked to submit monthly reflective statements, taking stock of their experiences in the past month and making plans for the coming one. These are shared with their mentors, who are second-year or third-year chemical engineering students, and faculty tutors in the department's mentoring program. This has turned out to be a simple yet effective way to integrate in-class and out-of-class learning, with the side benefit of fostering learning communities (around the adjustment issues of first-year students) within the department.

ASSESSMENT OF LEARNING OUTCOMES

In the spirit of outcome-based education, the real success of these courses must depend on a

direct demonstration that students have attained the intended learning outcomes. Since the development of skill and affective outcomes takes time, it is made clear to them (in the course syllabus) that having an awareness of the importance of a skill is not equivalent to the actual possession of that skill. Nonetheless, as pointed out by Kirkpartick,[4] reaction and learning lay the foundation for behavior and results. In that light the preliminary feedback from students has been encouraging. In the end-of-course evaluations, these courses received significantly higher scores than the average for the department and the school. Perhaps more important are the enthusiastic students' (voluntary) comments, some of which are produced below.

"(This course) teaches us many things outside the textbook. (These) are probably the most important things in our lives. I personally feel that this course let us know our inner self better."
"Students who have really paid attention throughout the course should be able to learn how to learn, which was one of the course objectives. I believe this is crucial."
"Since there is a sudden change from secondary school to university, there are a lot of things that need to be adapted. From this course, I can learn a lot of useful skills to deal with the difficulties faced and have the chance to know more about myself."
"The course enlightens us on the issue of career management and lifelong learning, which cannot be found in other courses."

Another source of feedback became available when students were asked to share what they had learned in completing the reflective statements. Their responses are revealing, as illustrated in the following examples.

"Usually I do not sit down and think about how I am coping with life as an undergraduate. I think this exercise helps me do so."
"Always think about what we have done, if it can be improved and set goals for the coming days."
"I have learned 'action' should be done once you have made a decision. Just 'thinking' of what you are going to do is not enough."

CHALLENGES AND OPPORTUNITIES

Students' positive responses to these two courses are similar to my experience when teaching a professional development course.[5] It thus appears there is room for "non-technical" courses in an engineering curriculum, especially in view of the desire to educate well-rounded engineering students for the modern workplace. Since these courses deal with generic learning outcomes that are not discipline-specific, they can be easily adopted by other academic departments both within and outside the School of Engineering. As an example, I am teaching ENGG001, Academic Orientation, this semester to about 100 year-0 engineering students in the foundation program. The course is also integrated with a "buddy program," akin to the mentoring program mentioned above.

Two obstacles, however, must be overcome before courses such as CENG001 and CENG002 can be made available to more students. First, they should become credit bearing. Currently both courses carry 0 credits and are graded pass/fail; the only motivation for students is that they learn something useful (or at least they feel they do). The fact that ENGG001 carries one credit is a step in the right direction. With a four-year curriculum, there should be room

for the introduction of three-credit development courses, either as required or elective courses, that treat the topics in CENG001 & CENG002 in more depth. The extra credits would also give students more opportunities to practice and develop these skills during the course.

Second, since both the content and pedagogy used in these courses may not be familiar to faculty members interested in teaching them, a concerted staff development effort is needed to "train the trainers." A two-day workshop should be sufficient, and most of the necessary training materials have been developed.

In sum, these two courses are warmly welcomed by students because they place their learning and development as the central concern. It is perhaps ironic that the approach is innovative because it adheres to an old-fashioned ideal, namely that teaching at its best is a human activity – in particular about enhancing human capacity.

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