

## The Impact of Curriculum on Engineering Students' Attrition

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### BACKGROUND

Attrition and retention rates have recently become a major issue for tertiary education. Student retention functions enhance student academic performances (Craig, 2011) and attrition rate is a performance indicator for fund allocating (Gabb, Milne, & Cao, 2006). Different aspects have been considered as attrition's roots, but Li, Swaminathan, and Tang (2009) have classified 3 main factors: internal factors (cognitive and affective), external factors (community, university influence) and demographic characteristics. Findings of Ohland et al. (2008) indicate that there is no difference between engineering and other students attrition rate, whereas other studies show a contradiction: engineering students do have a high rate of attrition (Smith, 2000), especially female students who trend to leave earlier (Marra, Bogue, Shen, & Rodgers, 2007). Recent statistics show unsatisfactory ratios of attrition across all disciplines in Australian universities (10.5%) and a large number of students who withdraw are undergraduate students (Olsen, 2008). Although engineering fields are mostly high demanded, Gabb, et al. (2006) state that students who plan to continue their studies in engineering have recently decreased. Meanwhile, curricula as an academic factor have a major effect on students' attrition and retention (Craig, 2011; Li, et al., 2009; Marra, et al., 2007; Marra, Shen, Rodgers, & Bogue, 2012). Most studies in attrition and retention have been done in the US and there is a lack of research on engineering students in Australia.

### PURPOSE

The objective of this study is to find attrition factors with particular focus on curriculum difficulties among engineering undergraduates in Australia. This study aims to answer the following questions:

- 1) To what extend internal factors influence students' attrition?
- 2) To what extend external factors influence students' attrition?
- 3) To what extend curricula influence students' attrition?

### DESIGN/METHOD

An online questionnaire including 68 closed-ended questions has been developed to collect the required data quantitatively. It consists of 10 questions in demographic part, 17 in external factor part, 15 in internal factor part, and 26 questions for curriculum requirement part. The instrument has been approved by the Human Research Ethics Committee, The University of Newcastle. It would be available for duration of one month. Undergraduate students from the faculty of Engineering and Built Environment including school of architecture and Built Environment, school of Electrical Engineering and Computer Science, and school of Engineering from The University of Newcastle will participate in this study. The questionnaire will be sent through the students' email address provided by the school. The result of this study will contain descriptive and inferential statistics. Confirmatory factor analysis will be used to develop the scales from the questionnaire responses. Scale validity and reliability will be estimated. Scales will be used to differentiate between sub-sets of the samples.

## **INTERIM FINDINGS**

The results of this study will reveal the factors leading to attrition. It also shows how certain aspects of curriculum design can affect attrition, in particular, the difficulty of subjects, practical uses or up-to-date nature of topics, and excessive workloads. It is predicted that the findings of this study can assist future policy-making at a tertiary level, especially for curriculum convenors.

## **FURTHER RESEARCH**

Retention as a major factor in higher education may engage students, lecturers, administrators, policy-makers and other parties who are somehow connected to education. At this stage, only current engineering students have been involved, but it is planned to employ lecturers, industries and withdrawn students to provide a better picture of the issue. And also a cross institutional comparative study will be conducted considering few Australian and overseas universities as future works. The result of this study might be used as an initial research in the process of curriculum development.

## **CONCLUSIONS & CHALLENGES**

Every year many skilled migrants come to Australia, however, universities are supposed to produce the required proficient. Clearly, Australia is not faced to the shortage of workforce, but a lack of skills. Curricula can be a solution for this issue if there is a proper adjustment between industrial needs and skilled graduates.

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## **KEYWORDS**

Attrition, Retention, Curriculum, Higher Education.