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Gender inclusivity of engineering students' experiences of workplace learning

Report on analysis of motivational experiences 2015

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www.ecm.uwa.edu.au/staff/learning/research/gender-inclusivity

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Background

The project 'Gender inclusivity of engineering students' workplace learning experiences', completed in February 2015, investigated gender inclusivity in engineering students' vacation employment and internships. To identify and describe inclusivity, a survey of engineering students at the three partner universities was conducted. Valid and complete survey responses were received from 160 engineering students who had engineering workplace learning experience (Male, 2015, p. 6). In the survey, students identified their most influential placements, and among other details they indicated the overall consequences of these placements on their motivation to become engineers and confidence in their ability to become engineers. For the majority of students, the most influential placement was positive. However, to understand gender non-inclusivity, explanations given by students for their motivation or confidence decreasing were analysed in the project.

To improve graduates' employability skills, there is mounting interest in Australia in increasing the quantity and quality of student industry placements (Kinash & Crane, 2015; Male & King, 2014; Smith, Ferns, Russell, & Cretchley, 2014; Universities Australia, Australian Chamber of Commerce and Industry, Ai Group, Business Council of Australia, & Australian Collaborative Education Network, 2015). Therefore, it was important to analyse the survey data containing engineering students' explanations of how placements increased their motivation to become engineers and confidence in their ability to become engineers.

Approval was granted by the Australian Government Office for Learning and Teaching, to commit the remaining grant money at the end of the project 'Gender inclusivity of engineering students' workplace experiences' to undertake analysis and reporting of the positive survey responses. With this support a senior research officer was employed for a little over a week.

Aim of the study

This analysis sought to contribute to improving workplace learning by addressing the following questions.

1. How have Australian engineering students' workplace learning experiences increased their motivation to become engineers?
2. How have Australian engineering students' workplace learning experiences increased their confidence in their ability to become engineers?

Project approach

Explanations were provided by all 86 students who reported an increase in their motivation and all 101 students who reported an increase in their confidence in their ability to become engineers, overall as a consequence of their most influential placements.

Consistent with the analysis of negative survey responses (Male, 2015), this study was framed within Markus and Nurius' (1986) possible selves theory and Eccles' (2009) expectancy value theory model of motivated behavioural choice. Possible selves theory links motivation to desire to achieve appealing possible future selves, and to avoid feared possible selves. In Eccles' model, motivation (Eccles, 2009, pp. 80-83) is explained as a combination of expectation of success and four categories of 'subjective task value': 'attainment value'; 'intrinsic or interest value', 'utility value' and 'relative cost'. All categories are based on the perceptions of the student in this case. The categories are self-explanatory, except attainment value which is the perceived importance of the goal to the student's identity.

The students' explanations for why their motivation to become engineers increased were analysed using the above subjective task value categories, and their explanations for why their confidence in their ability to become engineers increased were analysed as explanations for increased expectation of success. Their comments about why they chose to study engineering and their responses to questions about the placements helped in understanding the intention behind explanations for motivation and confidence increasing.

Key findings

Students identified with successful, professional engineers making significant practical achievements. They enjoyed satisfaction, challenge, interest, interaction with people and working on sites. They were motivated by opportunities to: earn money, travel, and make a practical difference to people's lives; achieve roles that they had found to be appealing; and achieve roles other than those they discovered they wished to avoid.

Students' explanations for increased confidence in their ability to become engineers included six categories of experiences:

1. Developing understanding of engineering practice and indeed practised engineering;
2. Discovering alignment between engineering practice and their backgrounds, strengths and capabilities;
3. Being given and meeting engineering roles or responsibilities;
4. Recognising a fit between their engineering education or applying learning from their engineering education in the workplace;
5. Receiving affirmation from their co-workers including peers, colleagues and supervisors; and

6. Recognising that they had experienced professional growth.

Findings

Workplace learning experiences for engineering students should be designed to include opportunities to: learn about practice, develop professional skills, interact with members of the profession, take responsibility, and receive constructive feedback.

Project output

A journal paper reporting this study (Male et al.) may be accessed via the project website (www.ecm.uwa.edu.au/staff/learning/research/gender-inclusivity).

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