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The adjustment of first year female engineering students into university: an evaluation

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Abstract

This study focused on the relationship between spatial ability and the academic performance of first year female engineering students. The study was multimethod, involving psychometric testing of all first year engineering students to compare the two and three dimensional spatial perceptual scores of male and female students and their relationship to academic performance in the first year Engineering Graphics course, and interviews conducted with a matched sample of 18 male and 18 female students taking the course.

The quantitative analyses indicated that male first year engineering students outperformed female engineering students academically for the reason that they had better developed three dimensional spatial perception than female students. In addition, students in the mainstream engineering graphics course outperformed students having special tuition in the subject, also for the reason that they had better developed three dimensional spatial perception. This study thus confirmed the results of previous studies which had reported that three dimensional spatial perception is a consistent influence on the academic performance of all first year engineering students.

The qualitative analyses of the interview data indicated that the majority of first year female students were underprepared relative to the tasks they encountered in the first year Engineering Graphics course. Many of the female engineering students experienced difficulties with the first year course content, and used a variety of strategies to get over their problems. Those female students who had not taken technical drawing at school level and female students who did not network with other engineering students were those likely to be those at a disadvantage. Personal factors such as low self-efficacy of female students relative to the tasks they were required to do in their engineering courses also militated against their successful adaptation to university life.

The qualitative analyses also indicated that social factors such as stereotype threat and low career self-efficacy decrease the likelihood that female students will attempt to enter

engineering as a field of study. This acts as an additional barrier to female students choosing engineering as a career. Overall, the evidence from this study would thus suggest that cognitive, personal and social factors negatively influence the academic performance of many female engineering students at time of intake to the university, indicating the need for additional tutorials and academic support directed at enabling their successful transition from school to university.