THE DEVELOPMENT OF SELF-EFFICACY IN FIRST YEAR BIOLOGY STUDENTS

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The transition from school to university introduces a variety of challenges for students (Parker, Hogan, Eastabrook, Oke, & Wood, 2006). First year students are often unsure of the expectations of university, and may need to adapt their learning strategies to succeed in this environment. Cognitive dispositions, such as self-efficacy, may play a role in determining the resilience of students as they progress through tertiary education. Self-efficacy encompasses personal judgments regarding one's ability to perform a task, and is correlated with academic achievement, task persistence, motivation and resilience (Bandura, 1986; Komarraju, & Nadler, 2013). Previous research has indicated that most students over-estimate their ability to perform academic tasks (Klassen, 2002). Moderate overconfidence can increase effort and persistence; however, a gross overestimation of one's abilities can lead students to pursue challenges beyond their capabilities resulting in potential failure (Multon, Brown, & Lent, 1991).

This study aimed to evaluate the self-efficacy of first year students studying a general biology course, and to measure changes in self-efficacy between the beginning and end of semester. Six hundred students were given the Biology Self-Efficacy Scale (Baldwin, Ebert-May, & Burns, 1999) in weeks two or three and again in weeks 12 or 13. The instrument consisted of 21 questions asking students to indicate their confidence in performing various biology-related tasks on a Likert scale from 1 (not at all confident) to 5 (totally confident).

A significant correlation was found between self-efficacy at the beginning and end of semester ($r = 0.562$; $p < 0.05$), indicating that students entering the course with high self-efficacy were more likely to have high self-efficacy at the end of semester. Overall, there was a significant increase in self-efficacy from the beginning to end of semester ($p < 0.05$). However, when the students were grouped by final grade, there was no significant difference in end of semester self-efficacy scores between students who went on to receive grades of 3 to 7. These results suggest that although self-efficacy has improved in the cohort overall, the degree of improvement is not related to their overall performance, and some students may be overconfident in their estimations of self-efficacy. When asked specifically about their confidence in achieving a grade of 6 or higher in the course, students were better able to gauge their likely academic performance. When students were separated by degree, there were clear differences in mean final grade, with Science and Dentistry students performing better on average than Human Movement Studies and Pharmacy students. However, the end of semester self-efficacy was not significantly different between Science, Dentistry and Pharmacy students, suggesting that the perceived self-efficacy of Pharmacy students was higher than it should be based on performance. Together, these results suggest that students are not always good at judging their confidence in biology based on progressive assessment. Overconfidence may have ramifications such as underestimating the amount of time required for study. Therefore, further research is required to determine whether overconfidence persists in later year students and to investigate mechanisms by which self-efficacy can be more accurately calibrated.

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