SELF-REGULATED LEARNING OF UNDERGRADUATE BIOMEDICAL SCIENCE STUDENTS

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ABSTRACT

With the wealth of information now available to students, one of the key benefits of a tertiary education is the opportunity to further 'learn how to learn'. While it is well established that a student's capacity to regulate their own learning is a key determinant of their academic success and ability to overcome academic adversity (Zimmerman, 2002; Turner & Husman, 2008), the development of self-regulatory skills are also critical to the development of lifelong learning (Schunk, 2005). However, despite their value, these skills are rarely explicitly taught in undergraduate science education. Self-regulated learning involves more than just knowledge; it encompasses self-awareness, motivation and behavioural adjustments made in order to implement knowledge. Research on self-regulation over the past twenty years has led to the development of a three-phase cyclical model of self-regulation (Zimmerman, 2000). This well-established model proposes that self-regulation occurs through three strategic phases, the forethought, performance and self-reflection phases (Zimmerman, 2000), with strategies from the forethought and self-reflection phases considered to be more advanced (Pintrich, 1995; Zimmerman, 2002).

Our study aimed to: (1) identify the repertoire of learning strategies utilised and relied upon by undergraduate biomedical science students; and (2) determine the relationship between strategies within the forethought and self-reflection phases and academic achievement within a course. The participants, second-year undergraduate Bachelor of Pharmacy students (n=140) undertaking 'Physiology and Pharmacology II', completed five 'meta-learning' tasks, each consisting of six questions that prompted students to consider their own learning strategies, at approximately two-week intervals during the semester. Student responses from selected questions were subjected to deductive thematic analysis with the qualitative analysis software *NVivo 10*^{TM} (QSR International, MA, USA).

Student responses indicated that although the majority of students had previously used a wide repertoire of self-regulation strategies, most relied primarily on strategies from the performance phase either alone (50%) or in combination with one other phase (31%). As it has been previously shown that effective self-regulated learners implement strategies from all three phases of the self-regulation cycle, this suggests that for many students, relying on a narrow range of strategies may be impairing their learning (Cohen, 2012, Kitsantas, 2002, Schunk & Swartz, 1993, Aregu, 2013). In a closer examination of the individual responses from high and low achieving students (n=24), we found that high achieving students used higher quality, better articulated strategies than students who achieved poorly. Specifically, there were significant correlations between students' achievement and either their strategic planning, self-evaluation, self-satisfaction, or adaptive reactions ($r=0.55-0.65$; $p<0.01$). In addition, high achieving students had a higher propensity towards setting both mastery and performance goals. This combination of strategies suggests that students who plan their learning, monitor and evaluate their progress, and are prepared to adapt their approaches to learning are more effective self-regulated learners, and in doing so enhance their academic performance. Together, these findings highlight the need for methods to encourage students to engage in all phases of the self-regulatory process, and to be adaptable in their learning strategies when circumstances require.

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