

From active learning to self-regulated learning

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As knowledge increases with often overwhelming complexity, the development of lifelong learning skills is an imperative for our graduates to excel in a global society. These skills are particularly important in professions such as science and the allied health sector, where the pace of new knowledge generation is rapidly accelerating. While it is well established that a student's capacity to regulate their own learning is a key determinant of their academic success, the development of self-regulatory learning skills are also critical to the development of lifelong learning (Schunk, 2005). Self-regulated learning involves more than just obtaining knowledge; it encompasses self-awareness, motivation and behavioural adaptations made in order to implement knowledge.

There are a number of proposed models of self-regulated learning, with differing levels of complexity (Boekaerts, 1997; Winne & Hadwin, 1998; Zimmerman, 1998). Most agree that self-regulated learning is adaptive and is therefore cyclical in nature. Effective self-regulated learners identify goals for a specific task and choose learning strategies to achieve those goals (forethought phase); then implement, monitor and modify those strategies as they progress (performance phase); they then reflect on their achievements and the learning process (self-reflection phase), and use this critical appraisal to inform future learning (Zimmerman, 2008). While poor self-regulation is not discipline-specific, its most adverse impacts may occur when it is coupled with other hindrances to learning. For example, those experienced by students in professional degree programs studying outside their area of expertise or interest while undertaking 'foundation' courses such as physiology.

In a recent study, we identified the repertoire of learning strategies utilized and relied upon by Bachelor of Pharmacy students undertaking a Physiology and Pharmacology course, and determined the relationship between strategies used and academic achievement. During the semester students completed five 'meta-learning' assessment tasks, each consisting of six questions that prompted students to consider their own learning strategies; their responses were subjected to quantitative and inductive thematic analysis. This showed that although most 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%). In a closer examination of 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 ($r=0.55-0.65$; $P<0.01$). High achieving students also 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 us to develop effective methods to encourage students to increase their meta-cognitive awareness of their learning, to engage in all phases of the self-regulatory process, and to be adaptable in their learning strategies.

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