Quantitative analysis of the development of self-regulated learning in year 1 medical students

C4ME SUPPLEMENT

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Background

Doctors must constantly update their knowledge in order to provide the best quality patient care. (1) To do so, they should become 'lifelong learners' (1) through the development of self-regulated learning (SRL). (2) SRL can be defined as the ability of students to be active participants in their learning, behaviourally, motivationally and metacognitively. (3) SRL is vital for succeeding Year 1 of medical school, yet the transition to university can be challenging for students. (2)

Medicine is a demanding course with a heavy workload. (2) Successful learning in Year 1 is dependent upon study time, yet many medical students struggle with time management (4) and 14.9% experience burnout. (2) Curriculum design also has an effect with students on problem-based learning courses developing better SRL skills than those on 'traditional' courses. (5) However, no studies focus on how a Case-Based Learning (CBL) curriculum affects SRL development. Therefore, the research question of this project was "how does a CBL medical course affect the development of SRL in Year 1 medical students?". The research aims were to identify and assess what factors affect SRL development in Year 1 medical students on a CBL course and study the extent to which these factors impact upon the cohort as a whole. The project was conducted at Cardiff University as the C21 Medical course has a CBL structure.

Quantitative analysis of the development of self-regulated learning in year 1 medical students
Jessica Randall et al.

14

Methods

A quantitative methodology was chosen so that a replicable, structured research instrument could be developed that can be used at scale on whole cohorts and would allow for a valid, objective measure of SRL skill. A systematic design process was employed to create a survey, including a literature review, theme identification, question design, expert review and piloting. Although the literature review revealed existing questionnaires on SRL, they were not fully applicable to this project's research aims and failed to assess SRL in context. As such, new scales were developed for this project and were based on a prior qualitative study conducted at Cardiff University.

Data was captured on the 2019/20 cohort of Year 1 medical students at Cardiff University during February and March 2020. The survey was delivered online and advertised through an announcement on the virtual learning environment Learning Central, social media and a lecture 'shout-out'. Ethical approval was obtained from Cardiff University's School of Medicine Research Ethics Committee.

Data was analysed using SPSS Statistics 25. Responses to Likert and frequency scales were converted to numbers depending on whether the items were phrased positively or negatively. 5 indicated a positive response to an item and 1 indicated a negative response. To compare individual items, the median for each item was graphed on bar charts. Composite scales were created from related survey items by calculating the mean composite score for each participant and assessed for normality with the Shapiro-Wilk test (W). The Cronbach alpha coefficient was calculated for each scale to assess inter-rater reliability. The Kruskal–Wallis test (X^2) was used to assess for differences between 3 subgroups when the scale was not normally distributed.

Results

32.2% (91/283 students) of Year 1 medical students at Cardiff University completed the survey. 74 respondents were female, 17 were male and the median age was 19 years. There was no significant difference between males and females for any of the outcomes measured, therefore, they can largely be considered a homogenous group.

Students' ease of transition to university was normally distributed (W[91] = 0.974, p = 0.061). 15.4% of students transitioned well to university (those with a score 1 standard deviation above the mean), 73.6% were neutral and 11% did not transition well (those with a score 1 standard deviation below the mean).

Student competitiveness was not normally distributed (W[90] = 0.945, p = 0.001). Instead, students were competitive with each other, as responses were slightly skewed towards the positive with the peak at 3.25-3.75. However, there was still a substantial tail suggesting a small number of students are not competitive. Students were more influenced by not wanting to appear stupid in front of their peers than academic ranking, with 67.0% and 36.3% respectively rating that that it applied to them frequently or all of the time. Workload was not normally distributed (W[91] = 0.966, p = 0.01). It had a bimodal distribution with peaks at 2.50-2.83 and 3.16-3.49. Although approximately half of students were coping well with their university workload, half were not. No students were coping extremely well whereas quite are few were coping extremely poorly. Students struggling with their workload were most likely to sacrifice socialising, sleep and exercise in order to cope, and least likely to sacrifice attendance at taught sessions. 54.9% would ask a Year 1 medical student for help; 35.2% would try to work it out for themselves.

No significant difference was found between those that transitioned well, transitioned poorly or had a neutral transition to university in terms of competitiveness (X^2[2] = 0.940, p = 0.625) or ability to cope with workload (X^2[2] = 5.215, p = 0.074).

Discussion

This study found that SRL development in Year 1 medical students on a CBL course is independent of how easily students transitioned to university as there was no significant difference when variables are analysed by ease of transition.

Instead, workload was key with over half of respondents unable to cope with it. This is concerning as workload is a major source of stress for medical students and can result in an inability to learn effectively, with a focus on surface rather than deep learning. (4) Students with underdeveloped SRL demonstrate more procrastination behaviours and, as they are reluctant to ask for help like 35.2% of respondents in our study, are at increased risk of poor academic performance. (6)

Respondents' coping strategies appeared to be poorly developed with them sacrificing key wellbeing aspects to cope with workload. Although there has been much focus in the literature on factors affecting wellbeing, including mental health and psychological distress, (7) financial pressure and work–life balance, (8) little has been done to study the impact of curriculum design. As SRL can be taught and improved through educational practice, (9) future research should explore whether altering the curriculum can improve SRL, workload coping strategies and subsequent wellbeing.

Lessons Learnt

The biggest lesson I learnt was that the amount of time, effort and dedication required to produce high-quality research should not be underestimated.

For example, even though there is a relatively limited literature base on SRL, it was time-consuming to review. At times, I felt overwhelmed by the volume of words to read. As I had not regularly read full articles before, preferring to skim the abstract, I was lacking in skill or experience in condensing large amounts of information. However, after experimentation, I discovered that I disliked having multiple web browser tabs open, so stored all details relating to the articles in a table.

I will continue to use this technique in the future as having specific column titles helped me to prioritise the key information I needed to draw out to inform my project and acted as a thorough reference document to refer back to, making the 'writing-up' process easier.

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