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Navigating the Terrain:

Emerging Frontiers in Learning Spaces, Pedagogies, and Technologies

Embedded online self-regulated learning activities improve student experience and learning outcomes

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Self-regulated learners achieve academic success by employing specific cognitive, metacognitive, behavioural, and resource management strategies. In fully online learning environments, these strategies are critical but are often challenging for first-year undergraduates to develop. This study presents a novel approach to supporting undergraduates' development of Self-Regulated Learning (SRL) skills in a fully online first-year psychology course. Seven SRL activities were embedded as micro-assessments within the summative assessment structure. Qualitative and quantitative data from students across multiple teaching periods were analysed. Results show that embedding content-specific SRL activities improved academic performance, increased engagement, and built a stronger online learning community. The impact of deliberately integrating SRL principles into the course design and assessment structure on student Self-Regulated Learning Online (SRL-O) questionnaire scores at the start and conclusion of the course will also be discussed. Overall, this study demonstrates that purposeful integration of SRL principles into course design and assessment can improve academic outcomes and foster positive learning experiences for first-year undergraduate students who are studying online.

Keywords: self-regulated learning, higher education, online learning, course design, student experience, mixed methods.

Introduction

Self-regulated learning (SRL) is a process in which learners actively participate in their own learning by setting goals, monitoring progress, and adjusting study strategies to achieve those goals (Broadbent et al., 2020). A review of six models of SRL highlights five key factors that are involved in the learning process: cognitive, metacognitive, behavioural, motivational, and emotional (Panadero, 2017). One of these dominant models, the Cyclical Phases Model (Zimmerman, 2002) proposes three phases of SRL: forethought, performance, and self-reflection. In the forethought phase, learners engage in task analysis, goal setting, and strategic planning. During the performance phase, they employ self-control strategies, such as time management, help-seeking, and metacognitive monitoring. Finally, in the self-reflection phase, learners self-evaluate their performance and make causal attributions, informing their future goal setting and strategic planning.

The importance of SRL in online learning environments has been well-documented in the literature. A systematic review found that SRL strategies, such as time management, metacognition, and effort regulation were associated with academic achievement in online higher education learning environments (Broadbent & Poon, 2015). Indeed, compared to traditional face to face environments, online learning requires a high degree of self-direction and self-discipline, because students must manage their own learning process often with fewer structured supports (Broadbent et al., 2020). Research examining students' SRL strategies in Massive Open Online Courses (MOOCs) have found that learners who reported higher levels of SRL strategy use, such as goal setting and strategic planning, were more likely to achieve their goals, and were more engaged with

course assessments (Kizilcec et al., 2017). However, research as also shown that online learners are less likely to employ certain SRL strategies, such as peer learning and help-seeking, compared to those in blended environments (Broadbent, 2017). Given the dominance of online learning environments in higher education, these findings highlight the need for targeted support in fully online settings.

Supporting the development of SRL skills is particularly important for first-year university students, who can find the transition to higher education especially challenging. The transition to university can be a stressful and difficult time for many students as they navigate new academic expectations, social relationships, and personal responsibilities (Larmar & Lodge, 2014). Online learning environments can exacerbate these existing challenges, as students may lack the structured support and social connections that are more readily available in traditional face-to-face settings (Broadbent et al., 2020). Therefore, supporting the development of SRL skills is crucial for promoting first-year students' academic success and fostering a positive transition to university study. It is critical to help students foster these skills early in their degree programs so they may continue to use and refine them throughout their academic journey and beyond.

Rationale and Aims for Course Redesign

This study aimed to develop SRL skills in first-year undergraduate students taking a Psychology elective by embedding SRL activities into the course design and summative assessment structure. As an elective, the course is taken by students from diverse academic disciplines and is taught fully online with no scheduled face-to-face contact. In addition to aiming to promote SRL skills to improve undergraduate learning outcomes, the redesign also addressed persistent low student engagement by building the online learning community via active peer-learning.

To promote SRL skills, the multiple-choice quizzes and discussion forum posts were replaced with seven SRL activities embedded as micro-assessments within the summative assessment structure. Five of these activities, contributing 10% to the total grade, were completed within small online study groups. These group activities included an icebreaker post, real-world examples of course content, mind maps, writing multiple-choice questions, and a learning reflection post. The activities were designed to promote forethought, performance, and self-reflection phases of Zimmerman's (2002) Cyclical Phases Model, by engaging students in collaborative peer learning (Broadbent, et al., 2020; Broadbent, 2017), and encouraging elaborative study techniques (Broadbent & Poon, 2015).

Students individually completed two additional SRL activities (worth 5%) to prepare them for a larger assessment piece, the course essay. These preparation activities were designed to support time management strategies (Broadbent & Poon, 2015) and provide opportunities for feedback on an essay draft before final submission. These activities encouraged students to actively engage with SRL strategies during their learning process, with the goal of improving academic performance, increasing engagement, and fostering a sense of community in the fully online environment.

Method

This study employed a mixed methods approach using both quantitative and qualitative historical course data to evaluate the impact of self-regulated learning activities on academic performance and student experience.

Academic performance data was obtained from 1,130 undergraduate students previously enrolled in a fully online first-year Psychology elective course at a large metropolitan university in Australia. To evaluate whether the revised course design and assessment structure improved academic performance, the essay and final exam grade distributions were compared between two student cohorts. The SRL group (n = 774) included students from seven cohorts who completed the course with the SRL activities embedded. The no-SRL group (n = 356) included students from two cohorts who took the course before SRL activities were added.

Additionally, student course evaluation ratings and qualitative course feedback was used to compare student perceptions and experiences between one cohort of students from the SRL group and one cohort of students from the No SRL group. The course evaluation data covers aspects of the student experience, including relevance of assessment, sense of learning community, and overall course satisfaction. Students completed the evaluation voluntarily at the end of term, responding to a series of course evaluation questions using a 6-point Likert scale ranging from strongly disagree (1) to strongly agree (6). The following questions were relevant to the aims of the course redesign:

1. The assessment tasks were relevant to the course content.
2. I felt part of a learning community.
3. Overall I was satisfied with the quality of this course.

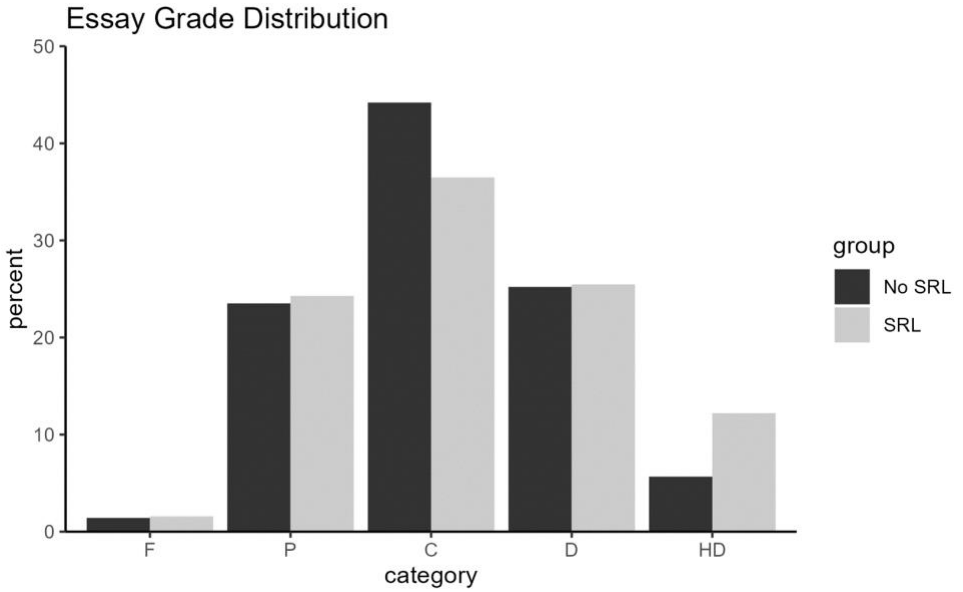
Qualitative data in the form of student feedback from course evaluations were gathered to provide additional insight into the impact the SRL activities had on engagement, learning community, and overall student satisfaction.

Results

Academic Performance

Chi-squared tests of independence were conducted to compare the grade distributions of essay marks and final exam marks between the SRL and No SRL groups. Grade distributions on the essay were significantly different between the SRL and No SRL group, $\chi2(4, N = 818) = 14.58$, $p = .01$. To compare groups across each grade category, chi-squared residuals were used as adjusted z scores, which showed the SRL group was significantly more likely to achieve High Distinction (HD) grades compared to the No SRL group (12% vs. 5%, $p < .01$). Conversely, there was a significant decrease in the proportion of Credit (C) grades in the SRL group compared to the No SRL group ($p = .01$). These effects are illustrated in Figure 1.

Figure 1. Comparison of essay grade distributions for students in SRL and No SRL groups.

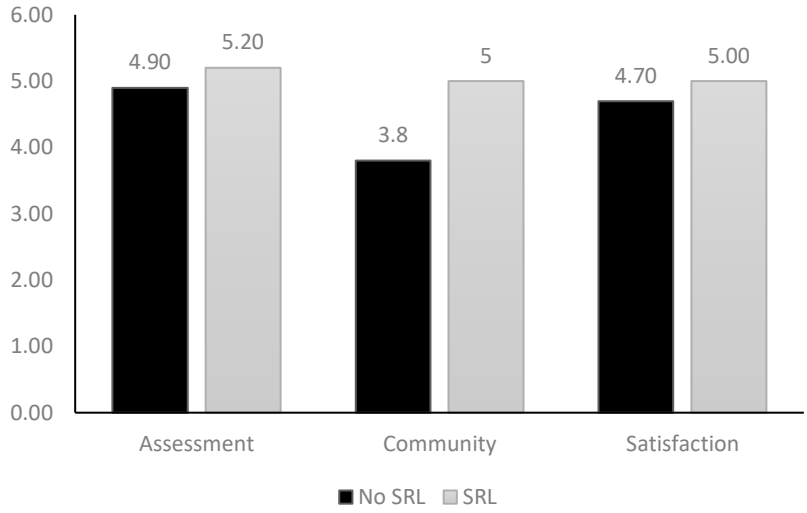


There was no significant difference between the SRL and No SRL groups final exam grade distributions, $\chi2(4, N = 795) = 5.52$, $p = .24$.

Student Course Evaluation

Figure 2 illustrates that, compared to the no-SRL group, the SRL group reported higher ratings for feeling part of a learning community, relevance of assessment for the course content, and overall course satisfaction.

Figure 2. Comparison of the SRL group and No SRL group course evaluation ratings of relevant assessments, sense of learning community, and overall course satisfaction.



Qualitative Student Feedback

Student feedback provided additional insights into the impact of the SRL activities embedded in the course. Compared to the No SRL group, students in the SRL group reported maintaining consistent course engagement and feeling a sense of belonging to a community:

> 'Since we have no set classes it was difficult finding a good time to go through the lectures and sticking to it instead of falling behind' (Student, No SRL group)
> '-I felt as though there was a lacking sense of a class atmosphere' (Student, No SRL group)
> 'Having lots of little assignments (like the SRL activities) also really helped me maintain consistent course engagement.' (Student, SRL group)
> 'I felt part of a learning community with the SRL tasks.' (Student, SRL group)

These qualitative responses support the improved course evaluation ratings suggesting that the SRL activities positively influenced students' learning experiences, course engagement, and sense of community in the online environment.

Discussion

The implementation of embedded SRL activities in this first-year online psychology elective course has had a positive effect on student learning outcomes. This finding is consistent with previous research linking SRL strategies to better academic performance (Broadbent & Poon, 2015) and learning outcomes in online environments (Kizilcec et al., 2017). The significant increase in High Distinction grades for the course essay suggests that the SRL activities are particularly beneficial for supporting students to achieve higher marks in this major course assessment. The upward shift in grades occurring from the middle of the distribution indicates that the course design intervention is likely helping motivated, engaged students achieve better

learning outcomes. While the improvements in final exam performance were not statistically significant, there was an upward trend in marks. The lack of a statistically significant difference in final exam grade distributions may be due to factors such as exam anxiety or strategic study behaviours given the exam is taken by students once essay marks have been returned and they have an understanding of what final exam mark they need to pass the course.

The student course evaluation ratings and qualitative feedback indicate that students perceived the SRL activities as relevant to their learning. Students report that SRL activities promote consistent engagement, structure the learning process, and foster a supportive online learning community. The increase in overall course satisfaction suggests that integrating SRL activities impacts students' perceptions of course quality and their learning experience. The increased course engagement and stronger online learning community reported by students are particularly noteworthy, given the challenges often associated with online learning environments. These improvements align with research suggesting that peer learning and community building are important factors in successful online education (Broadbent, 2017; Broadbent et al., 2020).

This study demonstrates that deliberately integrating SRL principles into course design and assessment structure can lead to improved academic outcomes and foster a positive student experience across various aspects of a course. The approach of embedding content-specific SRL activities as micro-assessments appears to be effective in encouraging students to adopt beneficial learning strategies and engage more deeply with course material. In conclusion, this study provides evidence for the effectiveness of embedded SRL activities in improving student outcomes and experiences in online learning environments. As universities continue to offer online and blended learning options, implementing such strategies could be crucial in supporting student success and fostering positive learning experiences in digital spaces.

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