

Improved student engagement and outcomes using a multi-purpose online platform – an alternative option for the one-on one tutor in large classes

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In large science classes the majority of factual content is still delivered *via* lectures. This limits the opportunity for students and staff to ask questions (Oblinger 2004), which impacts engagement and hence learning. Yet, it is well known that both small class tutorials (Wood & Turner 2012) and one-on-one tutoring (Bloom 1984) which enable a greater level of student-instructor interaction are more effective in increasing student learning and improving outcomes (Oblinger 2004). Hence, media-rich computer-based instruction in which the number of student-instructor interactions per hour can be increased dramatically (Oblinger 2004) may offer a valuable opportunity to improve student outcomes in large undergraduate classes.

Here we explore new online software to take the place of the one-on-one tutor in several large class settings in the Health Sciences to demonstrate improved student engagement and outcomes. We used the commercial cloud-based learning platform Lt hosted by kuraCloud, across a range of courses and study modes (> 2000 students), to improve student engagement with content, promote asynchronous self-directed flexible learning and afford consistent and equitable learning opportunities for large cohorts of on- and off-campus students.

For the courses Human Physiology, Physiology Essentials, Human Body 2 and Scientific Basis of Clinical Practice (SBCP) weekly interactive online revision tasks were developed that were topic-specific and comprised guided interactive questions and activities for knowledge recall (multiple choice questions, categorisation, drag-and-drop labelling) which were followed-up with concept maps and unguided extended response questions requiring text answers. Interactive tutorials and revision lessons with a clinical context (authored case studies) were used to highlight the practice underpinning the theory. These activities were designed to engage students in their learning and simultaneously assessing their understanding of the content in summative and formative modes.

For 2nd year Physiology, Lt was introduced to increase students' preparation for practical classes. Pre-lab lessons included theoretical content presented in a modularised fashion with interactive questions and exercises that students undertook individually in a formative manner at their own pace. Student preparation was then tested in a pre-lab class quiz.

The introduction of Lt increased: 1. student engagement with course content (61% of Physiology Essentials students completed 75-100% of all the online revision tasks offered; >90% students completed all pre-lab activities for 2nd year Physiology); 2. student satisfaction (7% and 84% improvement for Human Physiology 100 and Physiology Essentials, respectively); 3. the number of students achieving a passing grade of 50% or more for the final exam (23% average improvement over 2 years in SBCP and 27% in Physiology Essentials). For SBCP the results were comparable across both on- and off-campus cohorts.

Lt can be incorporated as a versatile platform that has increased capacity for designing and implementing interactive tutorial exercises, case studies and summative assessment. Our results suggest that the software, and the way that it is used, had a profound effect on the student learning experience and student performance and helped students to identify their knowledge, strengths and weaknesses, and thus tailor their study practices to individual needs. Hence, Lt has the capacity to become the one-on-one tutor for students in large undergraduate courses.

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