Abstracts: Presentations and Posters

PRECURSOR OR PRODUCT: THE BLENDED LEARNING ENVIRONMENT IN A CHEMISTRY MAJOR

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AIMS
Diverse learning platforms facilitate accessibility of content for non-traditional students and compensate for geographical limitations that universities might experience. In utilizing diverse learning platforms, it is critical to ensure effective and equitable teaching and learning outcomes across different student demographics. Based on the foundation and first year chemistry offerings at the University of New England (UNE), we aim to develop a theoretical construct for the basis of a long term quantitative study on student performance across multiple learning platforms.

SOURCES OF EVIDENCE
Pressure to speed up the evolution of blended learning in many courses comes from management, students, industry, and certain cohorts of academics. Students suggest all content and activities should be available online. Management emphasizes reaching a broader audience, and doing so economically. Industry wants novice and veteran chemists to revisit some fundamental concepts and lab skills. Educators want to embrace effective teaching strategies for every student population.

It is well established in the education literature that “diverse student groups bring with them a rich prior experiences and knowledge about science as well as their own ways of knowing, thinking, and communicating that influences their learning” (Walls, 2016). In a recent review (Cooper, 2018), several studies were highlighted as reporting demographic disadvantages to online learning, and other research (DeKorver, 2016) also suggests demographics and student goals correlate with assessment outcomes; which demonstrates that not every iteration within the blended learning spectrum is equal.

The learning platforms utilised to teach chemistry at UNE are diverse. Foundation and first-year chemistry content is presented in several combinations of the following: conventional lectures throughout the term, online lectures throughout the term, conventional laboratory experiments throughout the term, expedited laboratory experiments during one ‘intensive’ week, flipped classroom ‘workshops’ on campus, evening ‘tutorials’ on campus, and evening online ‘Q&A’ sessions. All students participate in a combination of the aforementioned learning platforms. Despite on-campus and online students being given the same content and assessments, student performance remains different.

MAIN ARGUMENT
Where do the learning platforms used in chemistry fit into the blended learning landscape? Are we currently a precursor or product of the blended learning format? We are at a pivotal point in education with the advent, flexibility, and economics of online study, and so we must re-evaluate the relative effectiveness of our learning platforms and our traditional methods to assess student learning, particularly in relation to diversity of learning platforms. As discussed, student demographics and individual learning goals are critical factors in performance; and if the design and range of learning platforms is satisfactory, they should be shown to support underperforming cohorts.

CONCLUSIONS
This work will elucidate the key components of first-year chemistry learning platforms and highlight any underrepresented student populations who will require the next step in evolution within blended
learning. This information will be an important consideration in the design of future teaching and learning strategies. The results of this study will be applicable to other fields of science traditionally taught through a combination of lectures and activities in a laboratory (e.g., biology, physics) or field settings (e.g., ecology, geology, environmental sciences).

REFERENCES
PARTNERS IN PROTEIN SCIENCE: STUDENTS AS CO-CREATORS IN CURRICULUM CONTENT AND ASSESSMENT

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PROBLEM
In recent times there has been a noticeable reduction in student engagement in higher education, particularly in traditional lectures, and regardless of whether they incorporate active learning components or performed in a flipped classroom setting. We have also observed a reluctance of students to participate in small problem-based classes or tutorials. Students have suggested that this is due to fear of failure or ridicule from fellow students, and explains why engagement strategies involving anonymity, such as clickers, remain popular with students. As educators we understand the benefits of active learning but the question we need to answer is, how do we encourage students to participate?

PLAN
While institutions grapple with improving student engagement and defining exactly what is meant by the term "engagement", there is an increasing trend to build partnerships between students and academics, with both parties contributing to the teaching and learning in higher education. The “Students as Partners” (SaP) approach encompasses students working with academics and providing opportunities to contribute to all aspects of teaching and learning (Healy et al., 2014). This approach is supported by the growing number of publications reporting the positive outcomes of involving SaP, which included: increased engagement, improved relationships, enhancement in student learning and a sense of being part a community (Cook-Sather et al., 2014; Mercer-Mapstone et al., 2017). In light of these findings, we decided to adopt a students as partners approach to a second year biochemistry course to improve engagement by allowing student to contribute to both aspects of the course curricula and assessment.

ACTION
In order to enhance the engagement in Protein Science, a second year biochemistry course we initiated a SaP approach allowing student to contribute to part of the curricula and the assessment. We felt that giving the students a say in what was taught and allowing them to design assessment would encourage them to be more engaged or have a vested interest in the course. Our SaP strategy was three-fold: 1. Provide student with a choice of topics for part of the course; 2. Create an opportunity for students to design multiple choice questions, with scaffolding, which form part of the assessment; and 3. Provide a forum for student reflection on evaluation of their partnership experiences.

REFLECTION
We were surprised at the level of engagement of the SaP in the course and in particular with the reflections provided by students. Of the students who participated in the SaP task, 86.4% rated the partnership experience for the curricula and assessment design as being useful (52%) or very useful (34.4%), and 80.5% indicated that they were engaged (32%) or more engaged (48.5%) as a result of being involved in the course design and assessment. Student reflections provided direct insight into student’s perceptions of the partnership, and endless information about student learning, metacognition, motivation and knowledge construction. The majority of the reflections on the choice of topic related to their future courses or degree programs or topics that they thought would be interesting, for example, “I believe these topics could be of use in my future as a researcher”, and “I chose Protein Therapeutics because I find it fascinating how proteins can be used to treat medical