

Catalyst Grant June 2014 Updates - Chemistry Discipline Network

Emma Bartle, University of Queensland

The aim of our project was to examine the effectiveness of creative podcasting assignment tasks in undergraduate chemistry teaching to develop communicative competence. This work exploring development of communication skills builds on previous work by the project team in which the student-created chemistry podcasts were shown to motivate students and encourage a deep approach to learning of core chemistry content. The ChemNet catalyst grant was used to fund a casual research assistant to assist with coding. The project team developed and tested a coding rubric with criteria related to communication, based on the literature. Each of the 117 podcasts produced by a first year chemistry class who received no explicit tuition about communication have been independently coded using the rubric by the casual research assistant and one of the project team members. These data are being compared to those from 180 podcasts produced by a first year science communication class who are predominantly science students but who had received a whole module on oral communication before creating their podcasts. The project team are currently analysing the data and have begun a literature review for a planned paper to disseminate the project findings.

Simon Bedford, University of Wollongong

Module 1 - Dragon's Den Simulation for Research Proposals A Peer Evaluation and Assessment Kit (P.E.A.K) for Professional Scientific Communication Skills.

Professional scientific skills as required by the AQF and assessed against Threshold Standards by TEQSA, such as written and oral communication skills, are critical for research students undertaking project work, and are currently lacking or poorly supported within the programmes of study. The emphasis at third, honours year and even first year PhD being towards assessment and not teaching and facilitation of these skills. Thus a series of modules could be created that would teach as well as facilitate these skills and then be deployed in both face- to- face and online environments to act as a capstone unit. Module 1 will be a Dragon's Den Simulation for Research Proposals. Thus provision of a Peer Evaluation and Assessment Kit (P.E.A.K.) for scientific communication skills enables us to have discernible impact with minimal change to the existing subject assessment tasks. These skills would be ultimately assessed during the normal research project assessments.

The P.E.A.K. module 1 has now been produced and will sit in a Moodle project site. This allows it to be imported into other subject sites if and when required. However, with time these will need updating and refreshing to keep them current. The Turnitin Peer evaluation tool (grade/peer mark)

was run as a pilot and this license has now expired. Furthermore, the peer- review “Dragons Den” will continue as a long-term feature for new PhD students who will undertake the pre- conference preparation course. Finally, we want to try and utilise these results to seek additional funding through the OLT to develop the existing modules and create new ones.

Dino Spagnoli, University of Western Australia

Choose your own Chemistry Adventure: Development of an online interactive pre-laboratory to improve the laboratory experience in first year chemistry.

The aim of this project was to develop an online interactive pre-laboratory for CHEM1003- Introductory Chemistry. During this semester we developed 5 online videos and online quizzes for the students to complete as part of their pre lab assessment. The videos were filmed, edited and uploaded to YouTube. The links to the videos can be found below:

<https://www.youtube.com/watch?v=VTqJryZM5Gw> Ions in Solution

<https://www.youtube.com/watch?v=qZNnRyrwlAg> Oxidation and Reduction

<https://www.youtube.com/watch?v=5YaE-eUhEPc> Changing Equilibrium

<https://www.youtube.com/watch?v=mPsBOffwZxo> Molecular Models

<https://www.youtube.com/watch?v=0ZbV4FvzAG4> Intermolecular Forces

The videos were embedded into the LMS (Moodle) website for the unit so that students had the video, laboratory information sheet and online quiz all in the same website. The videos and online activities are not, in their present state, an interactive approach. Although the students do get feedback from the online quiz questions after they have taken the assessment, there is still not the interactive aspect that was originally written in the grant proposal. This will be the future work of this project. We want to adapt the video into an interactive learning object. We have asked students of this year’s cohort to provide feedback, in the form of a questionnaire, so that we can evaluate the benefit of the online videos and highlight any need for improvements. We are in the process of analysing the student feedback to understand if this approach has helped to improve the student laboratory experience. Once we have analysed that feedback we will make improvements to the videos and then use these videos as the starting point for the interactive learning object. It is anticipated that the results obtained from this study will be compiled into a manuscript based on student perceptions towards the laboratory setting in a first year chemistry unit. Furthermore, results from this study have been presented on numerous occasions at national (2013 Australian Conference on Science and Mathematics Education, Canberra), and state conferences (WA Teaching and Learning Forum) and at University level (2013 Fogarty Foundation Postgraduate

Research Forum, presentation to the School of Chemistry and Biochemistry) to ensure the importance of our work reaches the broader scientific community.

Lachlan Yee, Southern Cross University

The funds were to support a research student to collate and process the data from 2 years worth of survey work on 1st year chemistry students in order to address attitudes and anxiety to chemistry and how that may affect their learning of the subject. The data has just recently been compiled with delays mainly due to my research student's diagnoses of an aggressive level of breast cancer. Fortunately a series of urgent surgical procedures has resulted in her stabilisation and the ability for her to complete the work. The data now resides with me where I have now submitted a conference abstract to the RACI National Congress to present and the plan is to submit a paper before the talk.

Mani Naiker, Federation University

The funds were to support a research assistance to help collate, enter and process the data that have been collected from students enrolled in health sciences programmes at the Federation University Australia (Mt Helen Campus) and at the Fiji National University (Suva, Fiji Islands) in order to validate an instrument (Attitude toward the Subject of Chemistry Inventory) to quantify 'attitude to the subject of chemistry' in health science undergraduates.

We are pleased to inform that the outcome of the research work has been accepted for publication in a peer-reviewed journal. The details of the publication are as follows:

Attitude to the subject of chemistry in undergraduate nursing students at Fiji National University and Federation University, Australia.

Stephen Brown¹, Lara Wakeling¹, Blake Peck¹, Mani Naiker¹, Dolores Hill², Keshni Naidu²

1 Federation University Australia

2 Fiji national University

Collegian: The Australian Journal of Nursing Practice, Scholarship and Research

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Peter Lye, University of New England

We have used the funds to employ two research assistants with interviewing 4 different cohorts of external 1st year students in relation to their use or not of online tutorials. We are currently in the process of analyzing the feedback.

Sue Pyke, Flinders University

A confidence-building introduction to the laboratory experience and fundamental chemical concepts was designed for students who have not completed year 12 chemistry. The experiment was introduced in Semester 1, 2014.