Final Report: UWA Improving Student Learning Grant 2009

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This report summarizes outcomes of my 2009 ISL grant project titled “Enhancing student learning in coastal science using field-based teaching activities.” The overall goal of this project was to develop and introduce new field-based learning approaches into the coastal units I teach (2nd and 3rd year). When I acquired this long-taught units during my appointment in the School of Earth and Environment commencing in 2009 (Semester 1), the material in these units had historically been presented to students in a primarily lecture-only format with assessments derived from Q&A based assignments that were solely designed to test retention and understanding of lecture concepts. With support from this ISL grant, I was able to redevelop the content and primary means of assessment for my coastal units. The greatest focus was a major overhaul of EART2221 (Coastal Environments and Processes) which I coordinate and conduct 100% of the teaching. As part of this, I decided to change this unit’s traditional means of assessment (from primarily standard written assignments designed to assess understanding of lecture material), to a series of more substantial field-motivated projects that required students to (1) collect field experimental data sets, (2) analyse data during focused laboratory sessions, (3) and link their observations and analysis to content from lecture in reports, i.e. as a means to synthesis theoretical lecture concepts with practical experience. As part of this project, I also introduced new field-based teaching approaches into the other units I taught into in 2009 (but did not co-ordinate), such as SCIE3304 (Field Techniques in Marine and Environmental Science).

These new teaching methods proved effective and were very popular with students. Over the last two years (Semester 2 in 2009 and 2010), I introduced six “lab” sessions at local beaches (Leighton and City Beach) for students in my EART2221 unit – due to the close proximity of the coast to UWA, these local field trips could be achieved within a regular three-hour laboratory time slot. Written student comments from SPOT evaluations consistently emphasized the effectiveness of these new field-based teaching techniques, with comments such as: “The field trips were outstanding in that they helped to cement ideas presented in lectures” and “The field trips and analysis of the data we collected improved my understanding of the theory.” As a result of the unit overhaul, SURF scores improved from historically being below my Faculty (FNAS) and School (SEE) average, to being among the most highly ranked (among my School’s second year units, EART2221 received the second highest score for “The unit was a good educational experience” in 2010). As part of this effort, I received my Faculty’s 2011 Excellence in Teaching Award for Individual Teacher. Since I introduced these field-based teaching approaches, student numbers in EART2221 have increased from roughly 40 in 2008 to 98 in 2010.

As part of the dissemination of the outcomes of this project, I have also participated in several community outreach activities. In particular, last year I hosted a special field trip for WA Geography year 12 high school teachers (linked through a conference by the Geographical Association of Western Australia) where I took roughly 20 teachers to Leighton Beach to introduce low-cost field-based teaching tools that could be incorporated into local high school geography programs. This year, I also hosted roughly 30 high school students through UWA’s “Day in the Life of an Environmental Science Student” where I introduced students to these field-based learning approaches.
Following what was proposed in my ISL grant application, the funding received has provided a foundation for transformation of these coastal units. Upon success of this grant, my School also contributed some additional matching funds which further enhanced the equipment available to achieve the outcomes. For this project, 10 GPS-tracked drifters were constructed and utilized in field-based labs for both EART2221 and SCIE3304 (this data was by students to investigate nearshore currents on beaches). A pressure recording wave gauge was also purchased and has become central to a field-based laboratory component focused on ocean wave properties. With supplementary funding provided by the School and additional ISL funds received, a higher end (self-recording) wave gauge could be purchased for this unit (Seabird Electronics SBE39) which could be deployed by students for longer periods.