



The Teaching-Research Nexus

A guide for academics and policy-makers
in higher education

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Examples from Australian universities

PHYS3330: Industrial Project. An Exemplar of the Teaching – Research Nexus

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Broad discipline area:

Natural and Physical Sciences

- Physics

Year level:

- Third (final) year undergraduate

TRN strategy:

- Involving students in departmental research

Teaching and learning context:

- Student-lecturer research collaborations

Brief description of the initiative:

Course genesis: Employers were consulted during Photonics degree planning yielding the following desirable graduate attributes from employers:

- Graduates to be able to think independently
- Graduates to have a high standard of presentation skills
- Graduates to have a high standard of written communication skills

A mini research project was seen to be the best means to foster and test these attributes. The plan was that the project be undertaken in the final semester of the final year to allow linkage with employers.

Course evolution: Since the rather dramatic collapse of the Photonics employers in Australia, the course has evolved somewhat to be a research project within the disciplines supported by Physics. It is attractive to “out of program” students taking it as an elective. The topic area is as broad as the discipline research effort so that we have had 38 students take projects in: Medical Physics (2); Biophysics (2); Space science (3); Surface science (2); Conductive polymers (6); Organic electronics (1); as well as Photonics (22).

Faculty are asked to put up projects for students and a meeting is held with all students at which the projects are explained. Students select the project based upon

their interests and the ability of the discipline to support the project. Normal teaching funding levels provide consumables for the course and research funds of individual academic supervisors fund equipment. It has been run virtually every semester since 2004 as there is little conventional teaching or administrative effort required for the course.

Assessment: Each project is expected to be the equivalent of a normal course, a quarter of the full time student load for a 13 week semester. The assessment comprises 50% written report, 20% presentation of which half is the oral presentation and the other half is the extent by which a panel of three academics gauge the student's knowledge of the topic and ability to answer questions at the time of presentation. The balance is divided into 15% for diligence and 15% for difficulty so that a balance may be maintained between projects of differing ease and that students are motivated to attend weekly meetings with their supervisor.

Outcomes: Anecdotal evidence is that students are enthused by the project and that this course has swayed students to stay on for Honours. The project course has served the discipline well with 15/38 students having progressed to Honours at Newcastle and four progressing to Honours at other universities to date. These projects have contributed to linkages between universities with the topics for three projects being supplied and in two cases actively supported by other universities. Currently nine of the former project students are enrolled in or were offered PhD's, six with Newcastle, one each with Australian National University, Adelaide and Swinburne Universities.

This individual photonics researcher has benefited from the linkages formed using capable students as a factor and has also benefited from student interest in establishing equipment for later laboratory instruction. There are synergies with ongoing research and the ability to have keen students e.g., programming control interfaces for equipment, is beneficial to the overall research effort. It is important that the projects be within the proposing academic's range of interest.

For further details:

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