

Notes from Steering Committee Meeting
16 July 2004

AUTC Physics Project:
Learning Outcomes and Curriculum Development in Physics

Present:

David Mills	Project Leader
Manju Sharma	Project Leader
Les Kirkup	Working Party Leader
Michelle Livett	Working Party Leader
Richard Newbury	Working Party Leader
Judith Pollard	Working Party Leader
Michael Prosser	Overview/QA
Alberto Mendez	Project Officer
Adrian Lee	AUTC
Maria Hunt (part of afternoon)	Working Party Member

Apologies:

Marjan Zadnik	Working Party Leader
Brian James	Overview/QA
John O'Byrne	Working Party Member
Kate Wilson	Working Party Member
Bill Zealey	Working Party Member
Susan Feteris	Working Party Member
Anna Binnie	Working Party Member
Geoff Swan	Working Party Member

Before the Agenda

The following existing “holes” in the project were listed for inclusion in the agenda:

- learning outcomes
- information about employment
- focus groups (for service teaching students)

Adrian Lee's meetings with various members of the team were briefly discussed. Pre-empting his arrival at the meeting his emphasis on engagement by all participating institutions and the importance of dissemination were noted. Also noted was the demise of the AUTC at the end of 2004.

Agenda Items

Progress Reports

Data from departments / interpretation of data

A good return rate of questionnaires was reported by Manju Sharma and Alberto Mendez - 30 out of 34 institutions. It was noted that 3 out the 4 outstanding departments (Edith Cowan, Flinders and South Australia) all have similar characteristics and if no data is obtained from them, something important might be missed.

The analysis of the questionnaire was discussed. It was agreed that there was a significant amount of data contained therein but that there were some limitations to the categorisation-of-responses approach to analysis. Missing from the graphical representation is the variation in, and the linkage between, answers. Mike Prosser noted category themes in Question B.1 similar to those described by Manju Sharma in the UniServe paper: resources; backgrounds of students; changing teaching practices; and the research/teaching nexus.

Task for Working Parties:

- Validate (and further develop) categories for questions and establish links between responses. *for their section*

Examples of good practice have been found scattered throughout the questionnaire's sections, but their evaluation and the context and constraints in which they occur are not well expounded on. This needs to be further explored if the project is to showcase one or more examples of good practice from every institution.

Issues that feature prominently in the responses to questionnaire:

- undergraduate research/project work a strong feature of many physics degrees
- increase in use of the web/computing as a tool in the teaching and learning of physics
- losses in traditional service teaching areas (engineering), and a consequent effort to move into new areas
- changing nature of physics "departments" – some swallowed up into larger schools; many spawning research centres

It was agreed that it's imperative to further investigate the motivations behind the increase in research projects being offered by some departments and whether research centres contribute to teaching and learning, curriculum development, etc.

UniServe Paper

The content and tone of the paper written for the upcoming UniServe conference was approved by all. It was agreed that the paper should be sent to the AUTC for approval.

DEST data

It was noted that the student numbers data provided by DEST contains some omissions, as well as being difficult to classify by year and by majors/service category. Useful information might be extracted by looking at the service to overall EFTSU ratios for 1st year and noting the trend over the 5 years of data available, as well as comparing them across institutions.

It was agreed that the student numbers published by the AIP are more reliable indicators of student number trends (higher years only) and that we will likely reference them in the final report.

CEQ data

Mike Prosser's cluster analysis of the CEQ data shows that there is a negative correlation between student numbers and the highest scores, i.e. the "best" institutions as designated by the CEQ data are those that have the smallest numbers of students. This implies that students prefer smaller classes.

The dataset however is very small and doesn't lend itself very well to analysis, especially when there is no guarantee that all the students' responses are directly related to studying physics subjects. For these reasons the CEQ will only be briefly mentioned in the report, only to show it hasn't been overlooked.

Conversation with Adrian Lee

Adrian Lee explained the importance of getting the report in on time, with Physics being a transition project following the dismantling of the AUTC at the end of the year.

He feels the team needs to establish strategies now which will ensure that the project has an impact beyond the final report. He stressed the need to engage all participants as soon as possible (by ownership of the project) and to develop and build physics communities across Australia.

The following possible ways to engage participants and impart ownership were discussed:

- provide feedback regarding questionnaire responses (this will be initially achieved by mailing of departmental summaries to participants for approval – to be completed by Alberto Mendez)
- run workshops in each state to involve participants in discussion of some of the issues that have arisen from questionnaire/interviews/focus groups (possible first opportunity might be at UniServe conference in September)
- development and provision of tangible benefits/awards for departments encouraging good teaching and learning practices
- creation of fellowship programs to encourage the development of good teaching and learning practices by young academics
- provide concrete recommendations that can assist heads in dealing with some of the issues they face

It was decided that all institutions should receive a project status report (to be written by David Mills) and an accompanying summary of their own department (as derived from the questionnaire by Alberto Mendez). This is a dissemination priority. Those institutions chosen for in-depth study will also receive a detailed explanation letter.

Interviews and Focus Groups

Selection of institutions

A discussion concerning the categorisation of institutions found broad agreement in the 3 types of institutions put forward by Manju Sharma and Alberto Mendez (traditional, contemporary and predominantly service teaching) and also of their constituent institutions. A consensus was reached over which institutions should be the subject of further, in-depth investigation. It was agreed that HOD interviews, a checklist of questions for teaching staff and student focus groups (for 1st year mainstream and service, 3rd year, and postgraduate) would be administered at the following institutions:

- ✚ Curtin (WA)
- ✚ Adelaide (SA)
- ✚ Queensland (QLD)
- ✚ Central Queensland (QLD)
- ✚ La Trobe (VIC)
- ✚ Swinburne (VIC)
- ✚ New England (NSW)
- ✚ UTS (NSW)
- ✚ NSW (NSW)

Task for Manju Sharma:

- Phone the HOD of each of the chosen institutions, explain the proposed next stage of the data gathering section of the project and ask for their approval and cooperation.

Heads/checklist

The HOD interview format and the 1 hour duration time suggested by Manju Sharma and Alberto Mendez (in consultation with Peter Fletcher) was approved by the team. A long discussion followed, with a myriad of suggestions/improvements/changes to the specific questions to be asked, both to the HOD and also as part of the checklist to be followed up at the institution.

Task for David Mills:

- Collate the suggestions made and produce a final document version of HOD interview and checklist questions (to be verified by team).

It was decided that David Mills will conduct the HOD interviews at the two Victorian institutions, as well as at Curtin in Western Australia. Alberto Mendez will conduct the rest.

Students

Mike Prosser's suggestion of using *nominal group technique* in conducting the student focus groups was ratified after a discussion on the required protocol.

Les Kirkup provided a set of specific questions designed for students in the 1st year service teaching focus group. These and other opinions were expressed and general agreement was reached on the changes to be made.

Task for Alberto Mendez:

- Collate the suggestions made and produce a final document version of student focus group questions (to be verified by team).

It was agreed that the person conducting the HOD interviews will not be able to coordinate the running of the focus groups at each institution. Substantial assistance by the individual departments will be required, as well as by the teaching and learning centre at that institution.

Graduates/Employers

Relatively minor changes were suggested for the graduate and employer interviews.

Task for Alberto Mendez:

- Collate the suggestions made and produce a final document version of graduate/employer questions (to be verified by team).

Task for Working Parties:

- Each team member to find one or two recent 3-year or Honours Physics graduates (from their institution) and arrange interview with them and their employer.

Good Practice

Michelle Livett presented a summary of the good practice features contained in the questionnaires. She identified a number of themes and noted their frequency and location. The themes were:

- undergraduate research or project work
- use of web for teaching, info, assessment
- generic skills, communication
- workshop tutorials, interactive labs
- laboratory visits, field trips, visiting speakers
- ongoing assessment
- interactive lectures

Dissemination

2004 Report

The draft report outline as developed by Manju Sharma was endorsed and various issues to be considered when writing the report were discussed. Some of these, not already covered above, included:

- report must be vibrant and positive and portray physics as a discipline that people should want to invest in
- the difficulty in identifying potential physics majors at first year level in the majority of institutions
- despite losses in service teaching physics has maintained student numbers

Literature Review

A document containing summaries of a range of papers on physics education research was produced by Alberto Mendez. A brief discussion ensued on some of the papers

included. Particular mention was made of a British survey into undergraduate teaching which Les Kirkup had independently read recently.

Task for Working Parties:

- All team members to make amendments to current list and add key papers not currently listed. Send to Alberto Mendez for collating.

Forward Planning

Timeline

An amended timeline was produced showing that although the project is still on track the next data collection period needs to commence as soon as possible and must be finished by mid to late September. The stage 1 report is due at the start of December.

Next meeting

Scheduled for Wednesday 29th September, to be held once again at UNSW. The meeting is open to all Working Party members who can attend. The Steering Committee will meet in the afternoon with Adrian Lee.

Action Sheet

Agenda Item	Task	Responsibility
<i>Interpretation of questionnaire data</i>	Validate (and further develop) categories for questions and establish links between responses. <i>for their section</i>	Working Parties
<i>Adrian Lee / Dissemination</i>	Write up a status report to be sent out to all institutions. It will contain the team's ideas for dissemination and the desire to encourage engagement and ownership by all participants. e.g. running workshops to discuss findings, issues, the report, etc	David Mills
<i>Adrian Lee / Dissemination</i>	Write up a summary for each institution from data collected in questionnaire. To be sent along with status report.	Alberto Mendez
<i>Approval from chosen institutions</i>	Phone the HOD of each of the chosen institutions, explain the proposed next stage of the data gathering section of the project and ask for their approval and cooperation.	Manju Sharma
<i>HOD interview and checklist questions</i>	Collate the suggestions made and produce a final document version of HOD interview and checklist questions (to be verified by team).	David Mills
<i>Student focus group questions</i>	Collate the suggestions made and produce a final document version of student focus group questions (to be verified by team).	Alberto Mendez
<i>Graduate and employer interview questions</i>	Collate the suggestions made and produce a final document version of graduate/employer questions (to be verified by team).	Alberto Mendez
<i>Graduate and employer interview questions</i>	Each team member to find one or two recent graduates (from their institution) and arrange interview with them and their employer if possible.	Working Parties
<i>Literature Review</i>	All team members to make amendments to current list and add key papers not currently listed. Send to Alberto Mendez for collating.	Working Parties