

NOTES FROM STEERING COMMITTEE MEETING  
13 FEBRUARY 2004  
LEARNING OUTCOMES AND CURRICULUM DEVELOPMENT IN PHYSICS

Present:

Professor Alan Robson	AUTC
Dr David Mills	Project leader
Dr Manjula Sharma	Project Leader
Associate Professor Les Kirkup	Team member
Dr Michelle Livett	Team member
Associate Professor Richard Newbury	Team member
Dr Judith Pollard	Team member
Associate Professor Michael Prosser	Team member
Professor Marjan Zadnik	Team member
Dr Peggy Spratt	AUTC secretariat
Mr Alberto Mendez	Project Officer

Apologies     Associate Professor Brian James     Team member

## AGENDA ITEMS

### 1.0 Welcome and introductions

Members of the Steering Committee were introduced and apologies were given for Brian James.

Papers were tabled on Issues and Privacy.

There was a request to add the Course Experience Questionnaire to the agenda.

### 2.0 Comments by the Chair

Alan Robson explained why the AUTC had chosen to undertake a project on Learning Outcomes and Curriculum Development in Physics. Main points were the slow growth in students choosing to study physics compared with other disciplines, the emerging relationships between physics and other disciplines such as biological and medical science and engineering. He also mentioned the very high costs of experimental physics which means there are financial pressures to take a regional or national approach to teaching physics.

### 3.0 Progress reports

#### 2.1 David Mills

David explained that issues such as privacy and consent to participate have to be dealt with in order to obtain approval from the ethics committee.

More than half the Heads of Schools have agreed so far and those outstanding will be followed up.

It is necessary to develop protocols, particularly for managing focus groups with students.

Source data will be obtained from all Physics Departments and, where possible, someone other than a project team member should provide this. It will be important in collecting these data to ensure that a collective rather than an individual view is provided.

In reporting, the team may want to name institutions, particularly when they are describing examples

of good practice. It was agreed that consent should be obtained before naming any institution in the report. The Chair suggested it would be helpful to have an example of good practice from each institution.

David advised that three new people have joined the working groups. They are Kate Wilson from ANU, Alex Merchant from RMIT and Maria Hunt from UNSW. Associate Professor John O'Connor from University of Newcastle will join the expert advisors panel and it seems likely that Professor Paul Ramsden from The University of Sydney will withdraw given his appointment to the UK Higher Education Academy.

## 2.2 Alberto Mendez

Alberto had developed a power point presentation to outline the scope of the project and a number of issues were raised in the context of the presentation. These included:

- How should subjects like astronomy be treated? It was agreed that this should be included.
- There will be issues in defining boundaries between physics majors and other physics subjects because it is taught across such a wide range of disciplines. For example should a subject be classified as physics if it is taught by a physicist?

NOTE: suggestion "If a physics subject is taught by a physicist in a multidisciplinary or engineering department/group/cluster then we will not include it unless there is a recognisable physics group within that multidisciplinary or engineering department."

- It is important to recognise that it is the content that is important and names do not necessarily reflect this accurately. It would also be possible to spend a lot of time dealing with these boundary issues for relatively little return.
- How will the matter of generic skills be dealt with. Questions that might be asked include how are generic skills perceived; are they embedded in the curriculum; how are they assessed? It was recommended that Alberto contact Adele Butler, manager of the Graduate Skills Assessment project at the Australian Council for Educational Research.
- Issues of internationalisation? It was agreed that cultural competency is part of working in teams but this could be dealt with as a generic skill.
- There might be value in focussing on gaps. For example what are the differences between what staff are teaching and what employers think the universities are producing in terms of physics graduates. Are staff teaching what students think they are learning? In this context there might be some value in analysing Course Experience Questionnaire data on student perceptions.

A web page has been set up and it was suggested that it would be useful to establish a locked section where members of the steering committee and working groups could access documents that were still in draft form.

## 2.3 Manjula Sharma Organisations chart and Gantt chart

Team leaders expressed some concern about the viability of their working group teams as they have had problems contacting them. It is important to know at this early stage if people are not going to be available.

It was suggested that teams should think about questions they might want to direct to the expert

advisory panel.

Team leaders will look at involving some students in the working groups.

## 2.4 Final report

The report should have an executive summary which will include the recommendations.

One possibility is a chapter for each working party but it would be essential to have a synthesis chapter as well. This might not be the best configuration and should be considered further as the project progresses.

## 3.0 Reports from Working Parties

### 3.1 *WP1A* Types of physics being taught, how evolving: mainstream Richard Newbury

It is important for this working group to come to some agreement on terminology and there was a suggestion that the word 'course' should be avoided. This working party should also include something about graduate attributes in its brief.

The working party will get as much data as possible from other sources.

It was recommended that members of the project team could look at high school curricula in their own States and identify changes this way rather than dealing with these matters in a questionnaire.

NOTE – you might want to ask for volunteers to do this or it will fall through the cracks, especially in NSW and VIC where there is more than one person on the Steering Committee.

### 3.2 *WP1B* Types of physics being taught, how evolving: service, multidisciplinary - Les Kirkup

This group also needs clarification on definitions and terminology such as service courses, multidisciplinary.

Most of the service teaching is in first year classes so these courses will be picked up if there is agreement to focus on first year.

There have been several iterations of this section of the questionnaire and the next stage is to trial it.

### 3.3 *WP2* Student satisfaction, attitudes, views and backgrounds Marjan Zadnik

CEQ trend data will be valuable for this part of the report. For example trend data for Curtin has been analysed over 5 years comparing physics with the broader science division and the whole university. The physics department has also been compared with the 3 top and 3 bottom departments in Australia.

As well as CEQ and GDS data, a report from the deans of science on employment data was recommended. Other useful data would be the number of graduates going on to post-graduate work although the project itself will be limited to undergraduate and honours courses. Concern about CEQ data from graduates was expressed by some of the committee who identified inaccurate information for their own institutions

Mike Prosser offered to do a cluster analysis on CEQ and GDS data for physics

The committee agreed that there was already enough data and further surveys would not be required. Focus groups could be used to ‘unpick’ the data and the structure of the focus groups could be informed by the data.

Input from current post-graduates on their student experience would be useful (although it would probably have a positive bias) and input from first year students in their second semester would also be useful.

It was recommended that the working party should look at work by Craig McInnis on the first year experience and Denise Chalmers on teaching large classes.

#### 3.4 WP3 Employer satisfaction, needs, involvement in course development Judith Pollard

This working party will focus on gaps between what is being taught and students perceptions of what they are learning and between graduate skills and attributes and what employers want.

Employers will be asked about their involvement in curriculum development – to what extent are they currently involved, what involvement they would like and how they might make a useful contribution.

This working party might find useful information in where graduates go (Deans of Science report, university careers services).

One difficulty for this group will be tracking the destinations of graduates with a basic BSc in Physics because there are no major employers and no employers recruit large numbers of graduates. One source of information might be post-graduate schools who could comment on how well students coming through undergraduate and honours programs were prepared for post-graduate work.

Another possibility would be views from Schools of Education concerning students with a major in physics who go into a Dip Ed program.

#### 3.5 WP4 Academic staff, professional development, shortages, identifying best practice - Michelle Livett

Much of the work of this working party will depend on results from the early stages although some of these questions will be asked in the general survey and/or at interview.

One aspect that would best be done at interview is the matter of institutional impediments to teaching quality and what is/could be done to deal with them.

#### 3.6 Questionnaire

There was agreement from the Steering Committee that the questionnaire is too big to get high quality data.

There is quite a lot of quantitative data from sources such as the CEQ, GDS and DEST data. Qualitative data may be gathered better through the interviews.

The questionnaire needs a short series of pointed questions that tease out important points.

The project should direct its inquiry to learning what characterises physics graduates rather than looking at objectives which are not always closely related to what institutions teach.

The Committee agreed that they would get a better response if the questionnaires could be dealt with in a face-to-face or telephone interview.

There might be value in looking at questionnaires from other projects.

There was a suggestion that the questionnaire approach be confined to data about physics majors. Data on service delivery courses could be collected in other ways.

A second suggestion was to focus particularly on first year courses and don't try to distinguish between physics majors and other streams.

A third suggestion was to use a stratified sampling technique for interviews and concentrate on physics majors graduates.

It was agreed that a short questionnaire would go to all physics departments and that more detailed information would be sought selectively.

NOTE: Some decisions will need to be made here fairly quickly so people don't spend time developing material that won't be used.

There was agreement that results from the questionnaire should be used to structure interviews and to identify institutions where more information would be useful.

NOTE: It might be useful to develop some criteria by which you identify institutions before you get results so you minimise bias eg the top and the bottom x institutions for student satisfaction on the CEQ . Talk to people who have expertise in sampling techniques.

The project team will aim to have a questionnaire ready to be trialed by early-mid March and will conduct trials at Curtin University of Technology, University of Technology, Sydney, The University of Sydney and James Cook University. The projected timeframe for the final questionnaire is April.

#### **4.0 Communication and Management**

A paper on dissemination was tabled at the meeting.

The team will keep the sector aware of the project through the bimonthly editions of *The Physicist* and these articles will also be posted on the web.

Stakeholders should be advised at an early stage of the project that they might have an opportunity to have input to the final report. For this reason it would be useful to run some workshops when the report is at a draft stage.

The team will aim to have a Stage 2 proposal ready for the AUTC by June.

Focus groups should be organised for early in second semester. A common set of questions should be developed for these sessions.

NOTE: Somebody needs to take responsibility for coordinating this.

##### *4.1 Budget*

Monash University and The University of Sydney are providing in-kind support and other universities might be prepared to run focus groups at no charge since they will get useful feedback from such sessions.

##### *4.2 Future meetings*

Another face-to-face Steering Committee meeting will be useful when the data collection phase is nearing completion and it was suggested that this could be scheduled in conjunction with the Uniserve Science meeting in September/October.

## 5.0 Other Business

Issues raised under this item included:

- Curriculum change and AIP accreditation
- Unit outlines and outcomes
- Outcomes focus
- Identify good practice and put up in a WebCT platform to share (the questionnaire could ask for examples to be considered by the Steering Committee)
- Importance of keeping in mind trends that are attracting students

### ACTION SHEET

AGENDA ITEM	TASK	RESPONSIBILITY
2.1	develop protocols, particularly for managing focus groups	Project team
2..2	contact Adele Butler, manager of the Graduate Skills Assessment project at the Australian Council for Educational Research	Alberto
	include a locked section on the project web site	Alberto
2.3	make contact with working group team members	Team leaders
	Develop questions for expert advisers	Project team
	Recruit students for working groups	Team leaders
3.1	look at curricula in states	Project team
3.3	cluster analysis of CEQ data	Mike Prosser
	look at work on first year experience (Craig McInnis) and Teaching Large Classes (Denise Chalmers)	Marjan Zadnik's team
3.6	look at questionnaires from other projects	Project team (Alberto)
	make decisions about the target group for the questionnaires	Project team
	trial questionnaire	Project team
	finalise and use questionnaire	Project team
4.0	stage 2 proposal by mid June	Project team
4.2	set date for next face-to-face meeting	David Mills