

Encouraging critical thinking in a combined Arts and Science course on the relationship between people and the environment

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Introduction

The Australian National University's course *Resources, Environment and Society* (SRES1001) was born out of the desire to combine Arts Faculty and Science Faculty approaches to understanding the relationship between people and the environment. While meeting the needs of both Arts and Science students it has also attracted a wide range of students from across **all** of ANU's faculties. At ANU, about 50 per cent of students are enrolled in a double degree, the most common degree being Arts/Science. In the two years SRES1001 has been running, it has attracted students from 32 different degree programs.

The course developed as a three-way collaboration between a Geographer – Dr Richard Baker, a Forester – Professor Peter Kanowski, and a Sociologist – Dr Alastair Greig. As such, it presents a unique interdisciplinary course that presents science in a way that is accessible to Arts students, and social science in a way that is accessible to Science students. It has successfully integrated the practical vocationally oriented aspects of first year Forestry, with first year Geography's broad ranging society-environment concerns and first year Sociology's emphasis on critical thinking.

The course has a strong skills development focus with the aim of giving students the research and communication skills required to successfully complete later year courses. Particular attention has been given to critical thinking and writing skills. The course is team taught by staff from the Science and Arts Faculties, key researchers from the ANU Research Schools, staff from the Information Literacy Program and the Academic Skills and Learning Centre, experts from Federal and ACT government departments, as well as key Canberra based non-government organisations. In one sense there have been two teams involved in SRES1001: firstly the course design and coordination team of Dr Richard Baker and Dr Alastair Greig; and secondly the wide range of presenters, panelists and tutors. In the two years that the course has been taught 55 experts have been involved in the teaching of the course.

Course objectives

The course aims and objectives have been developed to systematically address the findings of *First Year on Campus: Diversity in the Initial Experiences of Australian Undergraduates* (McInnis et al. 1995). In particular SRES1001 attempts to address their conclusions about:

- the importance of the social context in enhancing first year student learning;
- the need to present intellectually challenging courses that encourage independent learning; and
- the need to provide a supportive framework to address the difficulties many students have making the transition to the more independent learning style that is required at university.

The course aims have been designed as a response to the recommendations of this and other studies into first year learning. The course aims to:

- present an interdisciplinary, multidimensional approach to environmental studies;
- present and analyse multiple perspectives on environmental problems;
- embed academic skills and information literacy into the curriculum; and

- encourage students to be active learners through posing questions, investigating problems and participating in collaborative learning.

A team teaching approach that draws upon a diversity of perspectives, skills and expertise is essential to meeting these aims.

The course learning objectives are for students to:

- develop generic interactional skills
 1. interaction with themselves through reflection on learning
 2. interaction with information through information literacy
 3. interaction with others through communication skills (including speaking, facilitating small groups, writing);
- develop skills in inquisitive lifelong learning; and
- develop subject knowledge of key issues related to society, environment and resources.

A second research study that influenced the genesis of SRES1001 was *Commencing Study at the ANU - The Experience of the 1999 Undergraduate Cohort* (Pearson et al. 2000). The study indicated that 47% of first year students were unprepared for classes. Of these 18% of students reported never reading suggested materials with a further 29% only sometimes preparing for class. Also of significance was the finding that 45% of first year students were not comfortable participating in group discussions. Such findings made us realise the value of a process where students are required to prepare for tutorials and supported in developing skills in effective preparation. It also made the SRES1001 team conscious of the fact that there are many other areas where students feel inadequately prepared to contribute. This understanding has guided our approach of giving students as much support as possible in areas as diverse as:

- learning how to frame questions that they are required to pose to guest speakers (e.g. in early panels students are given 5 minutes in small groups to develop a question to ask);
- learning how to make observations and notes on field trips;
- critically assessing the validity of various web pages;
- researching and writing their first university essay; and
- producing and delivering *PowerPoint* presentations to their peers, orally and via the Web (examples of these presentations and other student work from the course are at http://sres.anu.edu.au/people/richard_baker/examples.html).

SRES1001 has been designed to develop the above skills in students with vastly differing capabilities. It provides a structure that extends those with strong abilities while at the same time providing the wide range of support that others need. Key elements in making this work are peer learning strategies and provision of multiple levels of support appropriate to particular needs. For example, *PowerPoint* skills are developed in tutorials, lectures and through online resources. Students are required to identify their level of competency and use the appropriate resource material to extend their abilities.

The coordinated team approach was a strength of the course in facilitating the acceptance of complex issues in a supportive framework where students integrated concepts, knowledge and skills. Baker and Greig provide the context for panel discussions by introducing key issues and concepts in lectures before they are explored in panels. After the panels, students are given the opportunity to reflect, read further and then come to tutorials to discuss the diverse issues raised.

Methods used in the course

SRES1001 uses a number of innovative teaching, learning and assessment strategies to facilitate the learning of complex concepts in a large class. This approach has been developed in response to the critical issues of first year students' transition to university study. From the first lecture, a cooperative learning environment is established. This environment includes encouragement and support for interaction, reflection and critical evaluation.



The whole class meets for weekly one hour lectures and two hour panel discussions. Despite the restrictions of large tiered lecture theatres, interactive ‘buzz groups’ are the norm. Students are supported to learn from each other in a large lecture context. For example, the first lecture (see video excerpts on http://sres.anu.edu.au/people/richard_baker/teaching.html) establishes the learning culture as students are encouraged to work in pairs to share their idea of what learning is. Later in the same lecture students work in small groups to discuss and suggest a ‘road rule’ for the environment, lastly they report back in both the lecture and the subsequent tutorial. This structure of supporting students in being comfortable to interact with others and with the whole class not only develops their confidence but also their social interaction with sub groups of the larger class. In the two hour panels the students have the opportunity to listen to contrasting views on an issue and to interact with a wide number of experts involved in cutting edge research and policy development in the environment-society field. In small groups, students collaborate to define some key questions raised by the panel discussion.

On the field trip to the University’s NSW south coast campus, there is a strong focus on exploring the contested and inherently political nature of environment-society issues. The field trip provides an opportunity to put theory into practice and to socialise with staff and students.

The concept of ‘reading the landscape’ was repeated many times in the course and I sort of like had an epiphany when we actually went on the forest walk and looking at ‘these are the trees and they’re not just trees, they’re history’. So you never look at trees the same way again. (Focus group 2003)

The tutorials are based around readings, role-plays and case studies. Students are required to prepare a one-page summary based around particular questions that relate to the tutorial. If they did not have the one-page summary ready, they are denied entry into the class. This is a particularly effective way to provide structure for first year students and to link with one of the course themes - the ‘Tragedy of the Commons’ illustrating the importance of a sense of collective responsibility.

The things that we had to do for the tutes are good. You are obliged to get it read and do the one-page summary and then be able to contribute. (Jack 1, research project, 2002)

The fundamental difference was the assessment and the way we were encouraged to make our own opinions, make our own perceptions. There was no right or wrong answers, there was no test. With the portfolio, with the essay we were encouraged to get the material, read it and formulate our own ideas. (Matthew 2, research project, 2002)

The SRES1001 curriculum has been designed to provide a transition for first year students from school to university study.

[SRES1001] helped me to not only adjust to university life (in both an academic and social context) but also to become much more capable and confident in the use of the various facilities and information sources provided by the university. (2002 cohort follow-up, email 2003)

The inquiry learning focus was exemplified by the encouragement and support to ask questions. SRES has kind of given me a real sense of responsibility to actually trying to know stuff as best I can...You can’t slack off! I think well I’m not going to be much of a use to the rest of the world am I, if I can’t come up with the best question in question time in panels! [laughter] It’s like, come on think of a good question [laughter]. (Louise 1, research project 2002)

Throughout the course careers in environmental management are highlighted through the guest presenters who work in these areas. Career paths of former students and their hints on how to get a job in their fields are also placed on the class web site (see http://sres.anu.edu.au/people/richard_baker/resources.html). This enables current students to see the type of career opportunities that might be available to them upon graduation.

The panels and experts from the field provided a good understanding of the huge possibilities job-wise and a deeper idea of what was going on in the industry. (Focus group 2003)

The emphasis on peer learning, inquiry, information literacy and academic skills has created a strong support structure for students. The course is designed to provide the generic and transferable skills needed for university study, including information research, essay writing, critical reading and information and communication technology skills. These information literacy and academic skills are developed via the following activities:

- lectures and hands-on tutorials covering searching the Web, evaluation of web, journal and other published resources and searching library databases relating to essay topic and tutorial debate topic;
- staged essay consisting of ‘webography’ (a group web page that involves students critically reviewing the relevance of web pages to the essay question), annotated bibliography, peer review of essay draft, submission of final essay, detailed written and oral feedback on essay and students’ reflections in learning portfolio on how they can improve their essay;
- tutorial covering critical reading and referencing skills and concepts; and
- hands-on tutorial covering *PowerPoint* skills.

Online materials and email communication enhance the strong support structure. The online materials include details of all lectures, panels and tutorials. The web site also includes:

- summations by the course coordinators of the panels;
- web links and further reading for each week;
- links to panel presenters’ web sites;
- assessment information, including assessment criteria for each assessment item;
- advice regarding essay writing, library research and referencing;
- field trip information;
- list of careers pursued by former students and their hints on getting jobs;
- exemplar examples of past student work;
- feedback on strengths and weaknesses of essays; and
- current student work, including the webography and end-of-semester tutorial *PowerPoint* presentations.

I find it really useful how Richard puts, especially for the panel for any of the lectures in fact, a list of pages we might like to go visit. I’m not that brilliant at scribbling down information during the lecture. I find it much better if they have notes on the Internet that I can print out or something, before or after the lecture. Then just sit in the lecture and just basically listen. (Tom 1, research project, 2002)

A further benefit of the course design for teaching and learning in large classes has been the strong emphasis on collaboration and peer learning. Students were able to learn from peers in 32 different degree programs. This diversity enhanced the contrasting perspectives presented in the panel discussions, role-plays and case studies.

Structured peer learning activities include students working in pairs to create a ‘webography’ of critically evaluated websites outlining the relevance to the essay question, which are placed on the class web site. One tutorial is devoted to a peer review of essay drafts, where students give each other feedback on drafts. Each student’s *PowerPoint* presentation in their last tutorial is also placed on the class website. The class has a strong team culture, due to acceptance of different viewpoints and a non-threatening environment in which to ask questions.

Student feedback

Evaluation strategies for SRES1001 have included a mix of qualitative and quantitative student, peer and self-evaluation:

- mid-course student group evaluation run by an external facilitator;



- summative student evaluations;
- peer evaluation via observation of classes by staff from the Centre for Educational Development and Academic Methods and Information Literacy Program and by the involvement of over 50 guest presenters;
- self and peer evaluation via weekly teaching team meetings;
- student self reflection in learning portfolios;
- end of semester focus groups and research project interviews;
- contact with students 12 months after finishing the course; and
- evaluation of student learning outcomes via formal and informal assessment and observation.

The data obtained from these strategies has been used to refine the course. Students frequently commented that being encouraged to explore a number of viewpoints (not just the lecturers') was liberating.

I felt that an important skill I got was the open-mindedness that they kind of told you you had to have and they really kind of pushed you into having this open mind. And the whole theory that several truths can coexist. Which makes it a lot easier in your other subjects when they say something that you don't completely agree with. You don't turn off any more, you start to think about things more and that's something this course encouraged. (Focus group 2003)

They also found that they gained an ability to look at the connections between subjects. Having so many people involved in teaching the course accentuated the links between concepts, issues, fields and disciplines.

It is SRES who made me aware of the fact that [there are] many links because they specifically ask you to look at them. Once you find one, you kind of get in a mind set where you go 'oh yeah, I've seen this in biology or people are talking about a certain concept and you go 'oh yeah, that's right' it's a different way of looking at it. (Jill 2, research project 2002)

Mature aged students returning to university have also found that the course meets their needs. I wish this approach had been taken the first time I came to university many years ago. The hardest thing when you are in first year is to actually know what's at the end and also what's expected of you. And I think that was one of the big strengths of this course. It was very explicit about exactly what was expected of you. (Focus group 2003)

Finally, the course has had an ongoing personal, intellectual and social impact on the way students approach their study.

SRES1001 opened my mind to the connections and consequences between society and the environment. **I loved the course, it didn't feel like 'work', it felt like learning.** The course addressed issues that provoked amazing discussion, I learned a lot from my peers because of this course. It has helped me with my study by opening my mind and not being bias[ed], and it has help[ed] me look at more then one answer to the questions. It has helped me in my life by showing others what I've learnt, and being opened minded releases a lot of pressure. (2002 cohort follow-up, email 2003, emphasis added)

Note on quotes

(Focus group 2003) indicates the results of focus groups conducted at the end of 1st semester, 2003; (2002 cohort follow-up email, 2003) indicates the results of a survey conducted via email at the end of 1st semester 2003 asking students about the effect that SRES1001 has had on their university studies; (Greg 2, research project 2002) indicates the student pseudonym and interview number for Mandy Lupton's Masters research project *Researching an Essay: Undergraduates' Ways of Experiencing Information Literacy* conducted with SRES1001 students as participants.

References

- McInnis, C., James, R. and McNaught, C. (1995) *First year on campus: diversity in the initial experiences of Australian undergraduates*. Centre for the Study of Higher Education University of Melbourne: Australian Government Publishing Service.
- Pearson, M. et al. (1999) *Commencing Study at the ANU - The Experience of the 1999 Undergraduate Cohort*. Report by the Centre for Educational Development and Academic Methods, Australian National University.

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