Teaching Ethics in a Virtual Classroom

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ABSTRACT

This paper describes an ethics course that is a capstone course in the undergraduate computing degree at Deakin University. What distinguishes this course from others is that it has a fairly large enrolment of students and it is delivered completely online. The students enrolled in the course come from a variety of backgrounds and many are international students for whom English is not their first language. The paper describes the course, how it has evolved over a five-year period and discusses the rationale and particulars of course content and implementation in the 'virtual classroom'. Some of the challenges and issues for teaching a course of this type are discussed. Suggestions are offered for faculty who are considering the implementation of a similar course online.

Categories and Subject Descriptors

K3.2 [**Computers and Education**]: Computer and Information Science Education

General Terms

Human Factors

Keywords

Ethics, computing curriculum, online courses, virtual classes.

1. INTRODUCTION

The inclusion of ethical issues within a computing or information technology undergraduate degree in Australia is mandatory. The Australian Computer Society which accredits the degree programmes has mandated a set of requirements, including a body of knowledge that covers ideas and commonly held principles that apply to ethical behaviour in the IT environment.

Students in our three-year undergraduate degree are majoring in computer science/software development, information systems or multimedia technology.

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These students all undertake a compulsory computer ethics course, usually in the last semester their studies. The goal of *Computers and Society and Professional Ethics* is to explore the impact of information technology on society and to investigate ethical and professional issues. The aim is to introduce students to standards of professional behaviour, in particular to the Australian Computer Society Code of Ethics [1] and the Code of Professional Conduct and Professional Practice [2].

There have been mixed reviews about the efficacy of teaching ethics at the start of a programme of study, as a separate course towards the end of the programme or simply spread throughout the curriculum [7, 9, 10, 11, 13, 15]. The approach in our School is to present ethics as a blend of study throughout the programme and to include it as a capstone course. By undertaking an ethics course in the last semester of study, students are able to draw from a wider range of life and study experiences. They also appear to be more committed to understanding the profession and the responsibilities of that profession as they approach graduation.

Deakin University aims to produce graduates with skills for lifelong learning and as part of this goal has mandated that every undergraduate should have the opportunity of undertaking an online course during their studies. Our School chose *Computers and Society and Professional Ethics* to be that online course. It is a core course with an enrolment of over 500 students and is delivered wholly online.

2. BACKGROUND

The current version of *Computers and Society and Professional Ethics* has evolved since the first version was introduced in 2000. It reflects the lessons learned from teaching the course over a five-year period; responding to student evaluations of course content and delivery; and from investigation into teaching practices of other faculty in the area.

The number of student enrolments has tripled since 2000 and this has also impacted on the way that the course is now administered [5, 6]. The increase in enrolments has been mainly due to the large numbers of international students now undertaking studies at Deakin.

Originally this course was offered in two formats: on-campus mode with face-to-face classes; and in off-campus mode (distance education) with print-based materials, enhanced by electronic communication. The transition to wholly online occurred in 2000. Since 2000 a number of significant changes have been made. A summary of these changes from the first

implementation of the wholly online version to its present form can be found in Table 1.

Table 1: Comparison of versions of the Ethics Course

Old Version	Current version
Emphasis on individual learning	Emphasis on group/peer learning
Focus on content knowledge	Focus on activities where knowledge is applied
Minimal use of discussion forums by students	Discussion forms used extensively for communication and collaboration
Schedule of topics and tasks on a weekly basis (13)	Sessions with associated group activities (6)
Course administration - faculty responsible for a particular cohort	Implementation of teaching teams with responsibilities for particular tasks
Large numbers of tutors with variations in 'level of course involvement'	Fewer, 'more committed' tutors
Assessment not transparent to students	Online submission and use of automated marking assistant – better moderation possible

2.1 Pedagogical Principles

The pedagogical underpinning of the ethics course is that students learn by doing [6]. Active learning strategies have been around for some time and are suitable for teaching courses such as ethics. Bonwell and Eison [4] as described in Wahl [16] suggest that successful active learning strategies are where:

- Students are involved in writing, discussing and reading
- Emphasis is placed on exploration of attitudes and values
- Emphasis is placed on higher-order thinking skills such as analysis and evaluation
- Emphasis on student-centred learning
- Emphasis on learning in groups.

According to Gotterbarn 'research done by psychologists has shown that discussing the issues between peers is the most effective method to teach ethics' [9]. While tutorials are opportunities to do this face-to-face, opportunities for students to discuss and evaluate issues online must also be made possible.

2.2 Course Content

Over the 13-week semester students are required to do six learning activities. The activities involve tasks such as reading, researching, online discussion, writing a group report and peer reviewing by reflecting on the reports of others. The content is aggregated into a number of topics including professional ethics, privacy and data protection, digital agenda and copyright and computer crime.

Each of the topics is a learning module in the learning environment *WebCt Vista*. Learning modules allow faculty to package resources in a structured way. One of the learning modules (Activity 3) can be found in Figure 1. The activity consists of readings from the textbook and from online resources available through the library; resources for doing further research and instructions for the group activity in the online tutorial. All content materials are available for downloading as a zipped file.

1. Activity Objectives
2. *Readings*
   - 2.1 Reading from text book
   - 2.2 Article - Private Eyes
   - 2.3 The Australia Card Debate
   - 2.4 Radio Frequency Identification
   - 2.5 The Rush to RFID
3. Personal Tasks
   - 3.1 Study Skills – referencing
   - 3.2 Review the Australian Privacy Legislation
   - 3.3 Review the privacy-related websites
4. Online Tutorial
   - 4.1 Submit Group's Privacy Notes
5. Download documents
   - 5.1 Activity3_Downloads.zip

Figure 1: Learning Module on the topic of Privacy

The online tutorial (see Part 4 of Figure 1) involves a number of steps:

1. Each member suggests 5 or 6 current privacy issues.
2. The nominated group coordinator for the activity collates the issues and presents a 'Top Ten List'.
3. Each group member then investigates one of the topics, researches current legislation and reports back to the group.
4. A short group summary of the key privacy issues is prepared and published for all students to access.
5. Once all group summaries are published, each student reviews one of the other group submissions, reflecting on what they have not covered in their own report.

All of the discussion is done asynchronously in discussion forums and students can access documents through a group-shared space.

2.3 Assessment

The assessment consists of an examination (40%); two individual assignments (30%) and participation in an online group discussion (30%).

For the first assignment in 2004 students were asked to produce an ethical scenario evaluation. For the second assignment they were asked to develop a computer usage policy based on research and comparison of three diverse computer usage policies that they had found individually on the Web.

Ethical scenario evaluations are a major assessment component in the ethics course. 'Ethical dilemmas faced by professionals are especially relevant for students majoring in computer science' and 'the challenge is to select the right ethical scenarios to accomplish specific learning objectives and/or to complement specific learning objectives' [3].

Students complete an ethical scenario evaluation in a group activity; they do a different ethical scenario evaluation in an individual assignment; and they answer an examination question on a different ethical scenario again. The *Four-Step Process for Ethical Analysis and Decision Making* [12] is used and students are expected to refer to the ACS Code of Ethics [1] in defending their position.

The scenario evaluation worksheet is comparable to the highly-structured position paper described by Wahl [16] where students know what is expected of them and faculty have a set of guidelines for grading. Unlike the position paper however the ethical analysis and decision making worksheet has a pre-defined format and grading for this worksheet is quite straightforward.

3. THE VIRTUAL CLASSROOM

The classroom learning environment is *WebCt Vista.* Table 2 shows the features and the tools that students use.

Table 2: Student Tools in the online environment

Category	Tools	Description and Use
Content and structure	Content Pages Learning Modules Organiser Pages Notebook File Manager	Course resources are set up in structured ways; management of files and folders
Comm-unication	Announcements	Communication on events
	Calendar	Scheduling of events for course and group tasks
	Discussions	Forums for asynchronous discussion
Evaluation	Assignments	Assignment Dropbox (submission and grading)
	My Grades	Assignment grades can be accessed
	My Progress	Summary statistics of tool usage

3.1 The Learners

The course has an enrolment of more than 500. There are a number of different student cohorts:

- Local and international students studying at the metropolitan and regional campuses
- Students from partnership institutions in Asia
- Distance education (off-campus) students studying anywhere in the world.

Students work in groups of 10. The group members are selected by teaching faculty who ensure that each group has a mix of students from all cohorts. Each group has a tutor.

Computing courses generally require students to use problem-solving skills in a technological environment, calling on programming skills as well as the ability to memorise content. The emphasis of the ethics course is quite different in that it requires students to discuss, analyse and use their critical thinking skills. It also requires students to write and communicate. These 'soft skills' are often not valued by students who perceive that the development of a product or computing artefact is the only valuable outcome for a course.

Many of the students are from different cultural backgrounds and English is their second language. Like Schulze and Grodzinsky [14] we have found that international students often fail to fully participate in discussions of ethical issues, due to culturally-based reluctance or a problem with written English.

3.2 The Teaching Faculty

There are three teaching faculty assigned to the course, one for each of the 'nominal' three campuses. However online teaching is not geographically bound and the division of labor is on a horizontal basis rather than a vertical one. This means that faculty do not have responsibility for a particular cohort but are part of a teaching team where responsibilities are task-based. For example, one faculty member is responsible for administration while another manages the discussion forums for assignments.

In Semester 2 2004 there were six tutors and each had responsibility for six or more groups. These responsibilities included mentoring the groups, facilitating the online discussion, marking activities and in some cases marking assignments and examination questions. The tutors were carefully selected. One tutor was a teaching faculty member and the rest were mature-aged postgraduate students with a fair degree of teaching experience.

3.3 Course Management

The management of large online classes can be problematic. However there are a variety of processes, resources, tools and techniques that can be used to help with learning resource delivery, the administration of students and groups, and with assessment. A summary of the course management tools that we use are in Table 3.

Table 3: Course Management Tools

Tool	Description and Use
Grade Book	Student administration and grading
Group Manager	Creation and editing of groups
Selective Release Map	Specification for release criteria of learning objects
Reports and Tracking	Creation of a variety of statistical reports on student progress

3.3.1 Management of resources

The course content is set up well in advance. Resources such as assignment specifications are available from the start of semester but other resources are selectively released as and when required. The rationale for selective release is to avoid information overload and to ensure that students follow timelines that will enable them to complete the work efficiently and successfully.

3.3.2 Management of students

Student administration is relatively straightforward in *WebCt Vista*. The tracking and reporting tools allow monitoring of student progress in the online environment. This is particularly important early in the semester to identify the non-starters and throughout the semester to encourage appropriate participation ('shirkers' and 'lurkers').

3.3.3 Management of student groups

The tutors are given guidelines about how to engage students in the online discussions. A typical tutor's load for a face-to-face tutorial is two hours per week. Online tutors are given the same allowance for one online group but this time is spread over a week. Setting up groups of 10 is facilitated by the *Group Manager* tool that allows groups to be created and modified easily.

3.3.4 Management of discussion forums

Posting and discussing topics in the discussion forums is by far the largest activity undertaken by students and faculty alike. According to statistics gathered at the end of Semester 2, 2004 there were 53,941 online sessions – events where students or teaching faculty were online in the course. The average time of access was nearly 8 minutes and the discussion sessions were 53% of the total sessions for the course.

A total of 13,585 individual postings were made by students and teaching faculty. Of these, 1270 were postings about technical difficulties and administration queries. The number of postings about technical difficulties has dropped dramatically over the last few years. For example, in 2002 nearly 70% of students indicated that they had had technical difficulties with online learning tools and resources.

Table 4: Postings in the Discussion Forums

Activity	Number of Postings per Group		
	Minimum	**Maximum**	**Average**
1	21	91	41
2	21	76	38
3	29	101	43
4	*WikiWikiWeb used as an alternative forum*		
5	22	88	42
6	21	109	51

The remaining 12,315 postings in discussion forums related to the online tutorials. These postings do not include Activity 4 in which the *WikiWikiWeb*, was trialed. Table 4 shows the average, minimum and maximum number of postings across the 50 groups. This represents about five to seven postings on average for each member per week.

3.3.5 Management of assessment

The postings in the discussion forums are the primary means of assessment for the group activities. For assignments, students use the submission tool and submissions are time and date stamped. We make extensive use of *Marker's Assistant* [17] that interfaces with *WebCt Vista* and allows tutors to electronically mark assignment submissions. This tool provides timely electronic feedback via email and results through *My Grades* and is seen as a fairer, more transparent method of assessment by both faculty and students alike.

Only four tutors or teaching faculty are involved with marking assignments. Moderation of grades is rarely required but can be done quite easily online. The added advantage of electronic submission, marking and feedback is that there is no messy paperwork or record keeping. Moderation in the examination is done by only having the four assessors responsible for marking particular questions across the entire class.

4. STUDENT EVALUATIONS

Students have evaluated *Computers, Society and Professional Ethics* since the course was implemented. On average about 50% of the students complete evaluations. Evaluations are done anonymously online and are administered by the University. There are 18 questions on the evaluation survey and responses are on a *Likert* scale from 1 to 5 (where 1 = Strongly Disagree to 5 = Strongly Agree).

On the whole the initial evaluations of the course were relatively poor compared with other courses in our School. However the evaluations were consistent with other wholly online courses across the University. The poor evaluations from our students have been attributed in part to problems with technologies; the new style of teaching and delivery; the fact that it is a compulsory course; and the view of our computer science students that softer skills are not as 'valuable'.

However the student evaluations have steadily improved each year. Figure 2 shows a comparison of the student evaluations for 2003 and 2004 for the largest student cohort. The chart shows mean response statistics for the 18 questions on the survey (standard deviations are not known). For each question there has been an improvement in the mean response over the two-year period. It should be noted that some of the questions on the survey are not particularly relevant for wholly online courses and thus one would expect low responses. Eg. Question 13 refers to the use of library resources.

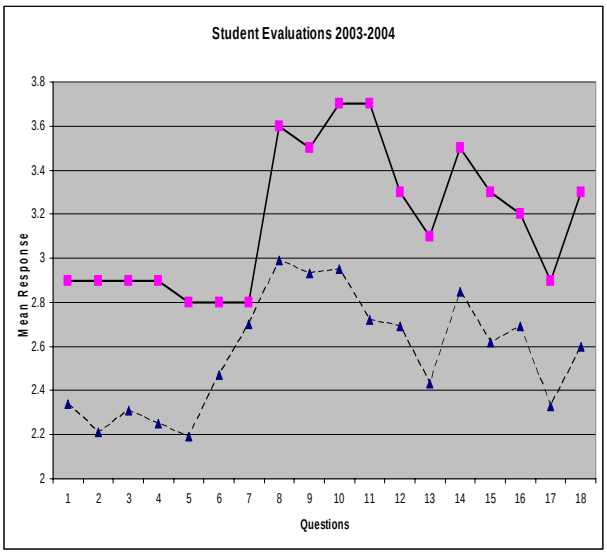

Figure 2: Student Evaluations of the Course

Questions which had relatively higher ratings in 2004 were:
Q8 Course developed my analytical skills (3.6)
Q9 Course developed my problem-solving skills (3.5)
Q10 Course developed my written communication skills (3.7)
Q11 Course developed my ability to work in a team (3.7)
Q14 My experience in this course encouraged me to value perspectives of people from different cultures (3.5)

There is obviously room for improvement particularly in the area of 'teaching' (Questions 1 to 7). There still appears to be a perception among students that wholly online courses are somewhat inferior to courses conducted with face-to-face classes and that teaching staff are not aware of difficulties that they (the students) face. Any negative experience a student has in a course appears to be compounded when online [6].

Anecdotal evidence suggests that students' cultural and learning background colours their perceptions of online learning. The impact of cultural diversity in online learning environments is currently being investigated.

5. CONCLUSIONS

Computers and Society and Professional Ethics has been delivered online since 2000. The main problems in the earlier iterations of the course related to technical issues as students struggled with the concept of online learning and technologies. By far the greatest challenge now is to provide appropriate collaboration and communication tools and to encourage students to use them effectively. The cross-cultural mix within the groups allows students to experience the type of global team they may be working with in the future. However working in a group can be a problem for some students who are not familiar with group work and for whom English is a second language.

It is possible to teach ethics in a virtual classroom but it must be done in a systematic way with appropriate pedagogical principles guiding the implementation. The learning environment must be easy to use and appear seamless to students. For example, students found the alternative collaboration tool (*WikiWikiWeb*) that was made available for Activity 4 was confusing and not easy to use. We believe that use of the tool detracted from the learning experience.

Like most teachers of ethics courses we struggle to make the course more interactive and meaningful for students and to engage them in the learning process. Students are often overawed by the amount of reading they are expected to do and it would be advantageous to have alternative media (audio, video or interactive artefacts) to cater for the different learning styles. The type of opportunity presented by Goldin, Ashley and Pinkus [8] with PETE (*Professional Ethics Tutoring System Environment*) appeals.

It is hoped that some of the work presented here may convince others that teaching computer ethics online is possible and rewarding.

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