An E-Learning Environment to Engage Students in Ethical Thinking

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ABSTRACT
The teaching of ethics has often proved to be problematic, with many students not engaging in classroom debates and experiencing difficulties in applying a critical and reflective thought process that is required for this particular subject. It is anticipated that a personalised e-learning environment of simulated debating can provide an engaging, inclusive and flexible setting to enhance students' attainment of critical and independent reasoning skills. The concept is that a student will participate in a simulated debate by answering questions on an ethical case. The answers that they provide will determine the outcome of the debate allowing them to view the impact of their decisions. The package will also allow them to view the actual progression of the case as it played out in real life. The package will be evaluated in a lab and in the field by introducing it as part of the teaching material at three UK universities. The outcome from this research will be a set of design guidelines for developing e-learning environments to teach ethics.

General Terms
Performance, Design, Human Factors.

Keywords
Teaching ethics, E-learning, Simulated debate, Personalisation

1. INTRODUCTION
Training ethically responsible researchers and practitioners is one area of teaching within all disciplines which proves one of the most difficult. Unlike other topics which rely on the understanding of theories and concepts and applying them to further scientific discovery, ethics is not ruled by proven theories and facts, but values and conscience. Including ethics into courses however is arguably more important than ever before in the light of recent advances in techniques and scientific knowledge, and globalisation. For example, the censored access to the internet by Google in China, the market in organ donation, pressures on developers to implement before testing is complete, resource allocation in the NHS, are being raised and debated. The science of today cannot be separated from its application in society; thus the fundamentals of a discipline and ethics cannot be separated either. To quote Cleminson, ''Scientists study a world from which they are a part not a world from which they are apart'' [1, p. 41]. When training the employees of tomorrow we must ensure they consider ethical issues and consensus of opinion when undertaking professional endeavours.

The purpose of this paper is to propose the use of an e-learning environment which has the potential for addressing the issues that arise from teaching ethics using traditional methods and techniques. The aim of our research is *to investigate whether a personalised e-learning environment of simulated debating can provide an engaging, inclusive and flexible setting to enhance students' attainment of critical and independent reasoning skills*. The paper begins by justifying the importance of teaching ethics, understanding the state-of-the-art and considering the role that an e-learning environment could potentially play in the teaching of ethics. The paper goes on to provide a description of the proposed e-learning environment. This is then followed by a discussion of how we intend to go about developing and evaluating such an environment.

2. Background
The subject of ethics is one of many that require students to think critically about issues. The importance for students within higher education to be able to think critically was recognised nearly 20 years ago [2] and since then there has been a number of publications related to this particular topic. However, never has the need for this type of transferable skill to be nurtured and fostered been so imperative or timely. One of the other reasons that developing and enhancing critical thinking skills in higher education is so important is the call from government and industry to make UK graduates more employable [3]. According to the report, although there has been an improvement in the UK's skill set this is not sufficient enough to compete on an international platform [4]. Therefore, with the correlation between skills and employment growing increasingly strong it is important that along with academic skills, students are also equipped with transferable skills when they leave university.

Most courses already endeavour to teach ethics to their students, however with varying success. To quote Guenther [5 p.19] "…students need to be encouraged to formulate definitions of social responsibility, to compare their definition

with those of others and to begin incorporating social responsibility into their future employment plans. Education should empower students so that they may shape the future of technology, not merely react to it." Many students can find ethics boring, particularly if the subject is taught in a non-interactive and disengaged way. Learning by observation, which is so often used in ethics teaching, requires interpretation and a critical approach which if untested may not be undertaken by the majority of students. The skill to exercise cognizant thinking is underdeveloped in the majority of students since assessment driven education allows for little time to engage in debatable topics.

Case studies are considered as an important tool in ethics teaching. However, Athanassoulis et al. [6] stress that they should be appropriately contextualised. Many tutors have tried to embrace this approach into ethics teaching by engaging students in debates and mock ethics committee meetings, seeing these as valuable tools in teaching the subject. These exercises attempt to connect students, possibly for the first time, with the issues and potential conflicts of interests presented in ethical debates. These however are not always ideal. Many students are reluctant to contribute to such groups and remain marginalised throughout the exercise. Other students with different cultural backgrounds may not identify with the issues being raised. In light of the problems associated with conducting discussion groups in the traditional way, we propose the use of an interactive and personalised e-learning environment to raise awareness about ethics that enables students to explore their critical thinking and reasoning skills.

Such an environment would most importantly ensure disengaged students participate in the debate. These students find it difficult to contribute to a classroom discussion due to feeling intimidated by other students, language difficulties or other problems. It would also allow students to undertake the exercise asynchronously, remotely, at their own pace and independently of moderating tutors which are usually a limiting factor when leading a large class. It will also support a highly differentiated, student led, learning environment by its personalised nature. The intention is not to replace existing teaching activities, but to be part of a blended learning environment that supports both face-to-face teaching and computer-mediated teaching. For example students could use this environment as preparation for a group discussion, or instead use it after a lecture to become more actively engaged with the material. The project reflects the current trend where face-to-face communication is moving ever closer to computer mediated interaction [7]. Furthermore, inclusive and personalised learning using e-learning technologies has proved successful in many other fields, see e.g. Gibbons et al [8] and Brinkman et al. [9], but as yet has not been brought to bear in the arena of ethical teaching. We feel that this technology has much to offer and will add depth and an extra dimension to traditional teaching methods used for the teaching of ethics. Further we use this new technological and pedagogical approach to further the research into harnessing technology to support disengaged learners in novel modes of thought.

3. The E-Learning Environment

The use of an adaptive[1] personalised multimedia e-learning package whose content can be manipulated through the student's input and which is not merely a student controlled choice of which objects to view is a novel concept. The e-package we propose will select which videos a student will see as a consequence of their interaction with the material. We suggest that since ethics is a subject in which there are many views upon a topic and no right or wrong answer, this approach will engage students in debating in a way not explored before. This approach would, we believe, be transferable to many subjects in which debate forms a crucial part of the area e.g. politics, law etc. Ethics is a core subject for many courses and is gaining precedent as the professional community and the public at large face an ever increasing array of new technologies and procedures which present ethically challenging debates. It is recognised that all graduates should be aware of ethical issues and be able to form educated and informed opinions in their professional and personal roles. Thus the design guidelines produced by the analysis of this package will be highly applicable, current and transferable to all courses. We feel that the package is particularly applicable where students are engaged in distance learning or where there are a high number of overseas students whose first language is not English as these students are particularly marginalised during in class debates.

3.1 Design

In designing our packages we will follow Weils' [10 p.501-507] recommendations to engage the students in "such concepts as duty, responsibility, morally permitted, morally prohibited, right and wrong, fairness, moral agent, and the distinction between morality, law, and ethics". Also to be included are his recommendations to encourage "loyalty (and critical loyalty), confidentiality, professionalism, occupational roles, and conflict of interest, that are germane to practical and professional ethics."

The simulated debates within the packages will incorporate the five goals of teaching ethics in higher education as outlined by the Hastings Center [11]. These are:

- stimulating the moral imagination,
- recognising ethical issues,
- developing analytical skills,
- eliciting a sense of moral obligation and personal responsibility, and
- tolerating and resisting disagreement and ambiguity.

We intend to produce the package in HTML and JavaScript web page format thus ensuring that software compatability issues will be kept to a minimum (all computers with a web page browser accessibility will be able to use the package).

3.2 The E-Packages

We propose the development and evaluation of three interactive video-based e-learning packages to facilitate the learning of ethics in the fields of computer science, business and health and social sciences. The package invites students to attend a simulated panel debate that has to make a decision about a case or project. These panels could represent a university ethical committee, a patient management team or the management team of a company considering contentious ethical issues. Each package will consist of four debates based on a separate case. This means that students within each package can attend four different panel meetings relevant to their particular discipline. In choosing our case studies, we have ensured that they are comparable to the case studies presented on the Higher

[1] An adaptive system in this context is one where the flexibility in the progression of the debate is controlled by the system based on the interaction with the user.

Education Academy's web site (Case Studies (Contextualised Scenarios) The Ethics Project Case Studies Database, n.d.) [12].

In preparation for the meeting students will have to read the proposal and related background material. The virtual meeting will progress through a number of stages depending on the case, addressing various ethical questions e.g.: Should the project or treatment be undertaken in this way? What are the potential risks involved? Are adequate procedures in place to manage these risks? Does the potential negative effect outweigh the potential benefit made by the project or patient treatment? In each of these stages students can watch videos of the virtual panel members, played by actors, put forward their views on these matters.

At the end of each stage, students have to select one out of a number of potential decisions. Depending on their selection they will be able to watch a video putting forward a counter argument, a further consideration to be debated or the video of the next stage. At the end of the debate the students will be asked to make a decision about the case and with any provisos. They will then get video feedback, giving them additional information from an external advisor if the decision was clearly inappropriate and ask them to revise their decision, or told that their decision is appropriate. As stressed in the document produced by Learning and Teaching Support Networks, the students will be made aware that in ethical dilemmas there is not a correct answer but instead, one requiring personal judgement [13].

The simulation will end with a video where an actor reflects on the process and the actual ethical implications as described in the case study. The learning packages thus facilitate the learning objectives that aim to give students the ability to recognise the ethical implications within their respective disciplines.

4. Method

In order to design and implement the e-packages a tri-cyclical approach will be followed. Each cycle will produce its own e-learning package. Lessons learned from one cycle will inform the following cycle with the aim of refining the e-package design, guidelines and evaluating the driving hypothesis. Each cycle will focus on a disparate set of case studies from a different discipline. This allows us to formulate a consensus design for such e-packages across disciplines.

As can be seen in Figure 1 each cycle consists of six activities: (A) Gather Requirements; (B) Design E-Package; (C) Develop E-Package; (D) Conduct Lab Study; (E) Conduct Field Study and (F) Review E-Package Design. The first three activities in the cycle constitute the development of the e-learning package. The last three activities in the cycle constitute the evaluation and reflection stages.

2. panel member; the debate is put forward as a series of small video clips, and between clips the student will answer questions. However, the answer provided by the

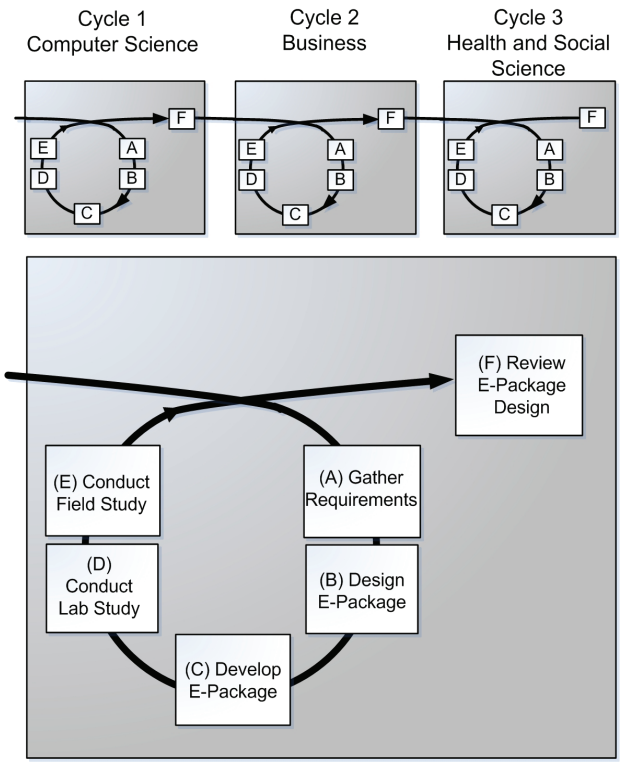

Figure 1. Conceptual framework of the method.

The Requirements Gathering activity (A) involves the researching and writing of the case studies which will involve interviews and documental analysis of meeting minutes as well convening a focus group consisting of discipline specialists, e-package designers, educational experts and an ethicist. Using a Joint Requirements Development (JRD) session in the form of a requirement workshop these stakeholders will assist in developing appropriate case studies for use in the e-package and define specific discipline requirements, e.g. requirements of professional bodies (British Computer Society, Department of Health, and Institute of Business Ethics), requirements dictated by students' profiles, discipline specific ethical issues.

The requirements will inform the design (B) which consists of story boards, software architecture and the interactive structure of the e-package. The package will be coded (C) in Java Script for easy cross platform accessibility, in which will be embedded short video clips of actors proposing the various ethical arguments associated with the case study in question. The package will be linked to a centralised database which will store information about a student's pathway as they progress through the simulated discussion. At this point the package will undergo usability testing. The package will be tested in an experimental setting in a laboratory (D) where students will be randomly allocated to a number of experimental conditions and a control condition. For example in the first cycle the focus will be on interactivity and its effect on student learning by comparing the following three conditions based on the level of personalisation by changing the task assigned to the student in the debate:

1. observer; student views a 20 minute video clip of a debate (Control condition).
   student will not determine the path of the debate, instead the student will follow a common pre-determined route (Experimental condition 1).

3. panel chair; similar as the panel member condition, however, the answer provided by the student will determine the path of the debate and thereby allowing the student to personalise their experience of the debate. This is the version of the e-packages as envisioned by the project (Experimental condition 2).

Similar experimental setups will be employed in successive cycles, the actual details of which will be influenced by the results of the study of the previous cycle. Psychometric inventories completed by the students will be employed to assess student's ethical awareness, attitude toward the subject matter and e-package. Subsequent to working with the e-package in the various conditions, the students will be randomly allocated to small groups within a classroom setting in which they will debate a new ethical case. Independent raters will examine the video recording of these debates to examine the effect of the different experimental conditions on indicators such as the number of times a student participated in the debate, the number of interruptions or counter arguments made, and the quality of the argument put forward. Finally, the students will be given a questionnaire to reflect on their experience of the simulated debate and the real debate.

The full e-package (the panel chair version) will also be evaluated as part of a taught course (E). The e-package will be distributed among three universities, to be integrated into their ethics teaching as part of their course material. At the end of the course a questionnaire will be distributed among all students to evaluate their experience with the e-package and a set of students will be invited for an interview to provide in-depth understanding of their rationale of using the e-package. Additional course assessment results will be compared with previous years' cohorts, who have had no access to the e-packages. Also correlation between e-package use and course assessment results will be studied. The data recorded in the centralised database, will also provide information about preferred pathways by students and may be correlated to gender and cultural background.

The final activity in the cycle is a reflection of the design of the e-package and its design process (F). In a similar type of workshop setting, the lecturers of three universities together with the participants of the focus group of step A will convene to reflect on the findings and interpret them in the context of improving the e-package. This activity will result in a set of design guidelines which will be refined in the consequent cycles. In short, the project will examine students' behaviour, attitudes and performance: both qualitative and quantitative techniques will be used as a mixed methodology approach, including: in-depth interviews, surveys, recording online usage behaviour, and learning assessments.

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