TEACHING COMPUTER ETHICS: NEED AND METHODS

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The lack of ethics in business and computing over the past decade has accentuated the need for ethics to be included in computing courses. Students must learn to discern between ethical and unethical behaviour. The continued rise in computer crime and unethical activity by computing personnel has cast doubts on the professionalism of the information technology industry. Some argue that ethics is embedded in culture and cannot effectively be taught. As there is no one accepted global culture, then there can be no one universally approved set of standards for ethical behaviour in information technology. This paper examines the current ethical climate in computing and the need for teaching ethics. Methods used in teaching ethics, particularly in relation to computing courses, are briefly examined and suggested topics for inclusion in a unit of study on computer ethics are discussed.

INTRODUCTION
The breadth of ethics in the computing industry encompasses not only highly publicised issues such as hacking, viruses and software piracy, but also the more subtle areas of abuse emanating from lack of professionalism and poor quality products and services. Information Technology (IT), even today, is an inexperienced profession operating in a competitive, consumeristic society. There is a growing awareness of ethical issues in the computing industry and an associated push to teach ethics in the computing curriculum.

THE ETHICAL CLIMATE AND THE NEED TO TEACH ETHICS
The unethical behaviour of the 1980s in Australia has highlighted the need for a review not only of ethics in the business community but also of education in ethics. One of the major aims of the Ethics Task Force established by the Institute of Chartered Accountants in Australia is to promote a new business ethics mind-set at the tertiary education level. This task force has been formed in response to 'the growing call for corporate Australia to re-define its ethical standards and to set new benchmarks of conduct' (Middleton, 1993). At the inaugural series of lectures in business ethics at Curtin University The Honourable Mr Justice David Malcolm stated, 'education in ethics is vital.' He suggests that a change in business ethics will only occur by a combination of education, inspirational leadership by example, professional development, self regulation and comprehensive laws (Malcolm, 1993).

It has become an integral part of business, and basic business ethics also directly applies to the computing industry. Ethics is taught to a limited degree in business and computing courses in Australian tertiary institutions. However, there is a pressing need for ethics to take a higher profile in education. The teaching of ethics will have a two-fold effect. It will raise the consciousness of ethical issues in the minds of students not only as a precursor to their work in industry on graduation, but also as a means of bringing to light questions regarding ethical behaviour whilst still studying.
A study carried out by Coldwell (1992a) raised the question whether universities are breeding grounds for computer criminals. Coldwell's research discovered that students working with computers had a different view of ethical behaviour from those working with people. He states 'Clearly, students from the technological disciplines do not consider hacking into other people's computer systems to be unethical. Neither do they seem to be aware of the social consequences of computer crime, apparently, as students of other academic disciplines."

It would seem that students are generally naive with regard to ethical questions as they arise in the real business environment. Parker (1990) suggests that students do not understand the complexities or moral bankruptcy of the technological society. He found students taking his ethics unit of study had an encouraging approach to the general principles of ethics. However, in practice, they showed tendencies to participate in unethical behaviour and a willingness to continue such involvement.

How do our values develop? Many would argue that values are learned in early childhood — at home, school, church. Could it be possible that ethics and values are continually formulated and re-formulated throughout life in response to both inner maturity and the influence of outside forces? Parker (1990) reports that the ethics displayed by students is a reflection of the attitudes in their surrounding culture — that is, the goal is to get by, and the ends can justify the means.

Subsequent research by Coldwell (1992b) discovered that teachers in technological or machine-related disciplines had similar views on ethics to the 'machine-people' students. In other words, the majority of both teachers and students in machine-based disciplines agreed that hacking was ethical. Are teachers influencing students in their ready acceptance and even positive re-inforcement of unethical behaviour? Possibly, the stance taken by teachers is just a mindless acceptance of a desirable

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learning approach — questioning and diligent application. However, it could also be viewed as a conscious stand by these teachers against an honest and moral approach. It would appear from Coldwell’s research that if teachers of technology are not raising computer criminals in our schools and universities, then they are certainly promoting socially unethical activities by encouraging abusive behaviour in computer-based education.

A survey carried out by Forcht (1992) reported that a majority of respondents considered ethics could be learned in a classroom, that employees should sign an ethics oath on commencement, and that organisations should develop and administer an ethics program for all employees. In addition, it was reported that almost half of respondents agreed that colleges and universities should incorporate an ethical use of computers course in their present curriculum.

CURRENT ETHICS TEACHING

The nature of computer ethics makes traditional methods of teaching, such as lectures, inappropriate. Just as computing cannot be effectively taught using lectures alone, so philosophical subjects such as ethics cannot be taught in the traditional way. An interactive approach is required along with subject matter that stimulates the grey matter and activates a questioning of values and morals.

It would seem that the most commonly portrayed method of teaching computer ethics is first, to make the students aware of the principles of ethics, and then to raise ethical issues associated with current events in the computing profession. Grillo and Kallman (1993) use this approach and include case-studies, reading material, role playing and group discussion.

Harrington and McCollum (1990) recommend an approach which includes discussion of ethical guidelines and codes of ethics, highlighting areas of social responsibility, claims of competence, conflict of interest, accountability and privacy. A major aim of their course design is to develop higher levels of ethical thinking by using a cognitive approach. Hence students develop their own set of values by consideration of searching ethical questions.

Parker (1990) uses a four issue approach to teaching ethics. Students read a chapter in a book on computer crime and its social consequences, followed by film clips, reading case studies, and consideration of current codes of ethics in the computing industry.

Martin and Martin (1990) analyse codes of ethics as a base for teaching computer ethics. Their objectives is not to indoctrinate students with new values, but to assist in clarifying and applying ethical values as new, complex situations are encountered. One important aspect of this approach is the belief that ethics should be taught not just in one course, and not just in computer courses, but across the total curriculum.

An alternate approach to teaching ethics is taken by Weiss (1989) who suggests that ‘Maybe by indoctrinating kids with the results of unethical behaviour in its goriest details and letting them decide and vote on how it came about and what was unethical and how to avoid it, we will form young adults who are capable of determining ethics for themselves from the data of the consequences. Show them, rather than tell them and hope they never have to see the consequences.’

Business ethics and computing ethics are currently taught in the Curtin Business School within the Bachelor of Commerce degree. Awareness of ethical concerns are raised in first year subjects and more detailed business and computing ethics issues are covered at second and third year levels. The use of films, case-studies and role playing, followed by group discussion, is designed to raise conscious thinking about ‘moral’ issues at both an individual and group level.

Harris (1993) discusses a particular video used in teaching computing ethics which has raised much discussion in his presentations to third year computing students. Like Harrington and McCollum, the aim of our approach at Curtin University is to stimulate cognitive action.

CONTENTS OF ETHICS INSTRUCTION

The following topic areas are suggested for inclusion in the teaching of computer ethics.

Principles of Ethics

Several definitions of ethics and an explanation of ethical concepts are presented and discussed. For example, the following definition by Malcolm (1993) could be useful:

Ethics is a branch of philosophical knowledge which involves a study of the principles of morality, of right and wrong conduct and of good and bad, virtue and vice as they relate to behaviour of men and women or even groups or whole societies. (p. 5)

The philosophy of ethics should be covered and how ethics pertains to individuals and groups. Grillo and Kallman (1992) suggest a useful scale of ethical principles, commencing with egoism, the most self-centred, ranging through to respect for people, the highest, most selfless principle.

Classification of Unethical Behaviour

Where does one draw the line between ethical and unethical behaviour? Is there any difference between unethical and abusive behaviour? Lack of ethics can be viewed on a continuum, as illustrated in Figure 1. It commences with ethical behaviour at one end, moving to unethical behaviour, then abuse, and finally to crime at the other end. Figure 1 attempts to define each stage more fully by listing concepts and words which relate to each of these stages.

Ethical behaviour pertains to honesty, high standards and principles, values and morals which respect other people and ourselves, and a conscience triggered by our actions. Unethical behaviour is dishonest, immoral, unprofessional and unfair behaviour. Unethical acts are misrepresentations of the truth. However, unethical acts are, in many cases, difficult to differentiate from abusive acts, which cause damage or exploit and misuse people, resources or situations. Criminal acts are a little easier to define as these are violations or malpractice which can be easily identified based upon written laws and regulations (Figure 1).

Ethics and the Law

This section covers the aim of the law to define social ethical standards and enforce compliance. Questions relating to the ethics of obtaining evidence and other current legal practices are presented.

The legal aspects and current state of the law affecting the computing industry are discussed, including criminal codes and other relevant State and Federal acts of parliament.

Codes of Ethics

What is a code of ethics, how it applies to a group ideology, and its use in regulating specific professions is discussed. Current codes of ethics in professions such as medicine and engineering can illustrate the practices of self-regulating groups.

An analysis of current codes of ethics in computing-related professional groups and societies is carried out. Some discussion as to the effectiveness of such codes in computing is also useful.
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Figure 1 A Classification of Behaviour Relating to Ethics

Computer-Related Social and Ethical Issues
Ethical issues such as those suggested by Forrester and Morrison (1990) (including responsibility for computer-related disasters, fraud, hacking, privacy, intellectual rights, quality of software, viruses and worms, and copyright) are always guaranteed to raise at least warm discussion.

Factors Influencing Ethics
A look from the inside always presents a different viewpoint on organisational and personal ethics. For example, an awareness of factors including the need to survive; financial well-being; cultural, social and religious ethical beliefs; group loyalties; personal goals; and rules and regulations. Individual behavioural traits such as mood, fear, and motivation or physical influences like drugs (or even biorhythms) can also affect personal behaviour.

Computer Crime and Abuse
This section covers the different types of computer abuse and trends in computer-related crimes and the computer underground. Ethical issues pertaining to hacking, industrial espionage, fraud, unauthorised access, theft and sabotage are discussed from the point of view of both perpetrator and recipient.

Managing Ethics involving Computers
The practical tools of managing ethics relating to information technology embrace:

- the design of codes of ethics and codes of conduct, their implementation and managing compliance;
- the development of policies regarding ethics and ethical behaviour;
- the design and establishment of training programmes for management and staff at all levels;
- planning and control of security, privacy and responsibility from an ethical perspective;
- ethical aspects of quality control and management; and

- management by example.

It is important to note, however, that ethics cannot be taught, only learned. Due to the external influences on the developing of personal ethics, and the different ranges of acceptable behaviour from a cultural and social stance, it is not possible to develop globally accepted standards or codes for ethical behaviour in the computing industry. As pointed out by Parker (1990), ethical values are formulated by one's own ethnocentric rationalisations. In other words, what is considered right, legal or moral in one country or culture may be considered wrong, illegal or immoral in another. Due to differences in cultural value systems, it is not possible to develop 'absolutes' with respect to ethical behaviour in computing and business.

CONCLUSION
Establishing globally accepted standards for ethical behaviour in the IT industry is not possible as basics ethics are derived from cultural and social value systems. Acceptance of codes of ethics established by professional controlling bodies must be universally accepted and willingly upheld by the majority of members in order to challenge other loyalties and value systems.

Parker (1990) suggests that 'ethical conduct is a skill to be learned, a way of behaving in social situations, a way of thinking about oneself, and a life-long process of development.' In order to achieve this, it is necessary to encourage a more enlightened perception of ethical issues by stimulating a questioning and reasoning of values and morals in the classroom.

There exists an immense mistrust of computing personnel in the business community, based upon unprofessional behaviour of IT specialists. Computers are being utilised in an expanding range of disciplines, and the future vision sees this trend increasing. As a result, the teaching of ethics needs to be included across all disciplines, not just computing.

As computing professionals and teachers who claim to live by an ethical code, we must at least attempt to highlight ethical concerns for students under our instruction. The teaching approach discussed above, which is based upon cognitive stimulation is not guaranteed to result in highly ethical decisions in all situations. However, it is designed to raise the consciousness of ethical issues in the future IT professionals who pass through our classrooms.

REFERENCES