

# THE PROBLEM OF INTEGRATING ETHICS INTO IS PRACTICE

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## Abstract

*In this paper we discuss a number of implications which follow from the way that the information systems discipline has developed, largely separately, from computer ethics. These include the tendency of quantitative IS studies on ethics to focus on ethical decision making as the most significant activity in the business of behaving morally meaning that other aspects of moral behaviour are overlooked. A second, significant, implication is the difficulty of integrating ethical practice into IS development. This is manifest initially in terms of IS education but later in relation to the development, and use, of IS in the workplace. Focusing on information systems development, we discuss practice, focusing on ethics and IS practice especially rationalistic approach to decision making, the support that conventional development methodologies offer the moral agent followed by learning to practice or the business of integrating ethics into IS education and how to turn moral decision making into teachable ethical constructs. We conclude by offering some suggestions for future directions.*

*Keywords: computer ethics, information systems, information systems development methodologies, IS education.*

# 1 INTRODUCTION

Information Systems (IS) has developed over the last twenty or so years into a broad discipline that has developed largely separately from information or computer ethics (CE). As a backcloth, we note a turn to ethics in literature, the humanities and social sciences, and a renewed interest in science and technology ethics due to concerns over ecological issues. Ethics appears to be high on the agenda for many disciplines. Therefore, with the explosion of interest in participative approaches, and the recasting of IS development as a thoroughly social and cultural enterprise from the 1980s onwards, we might have expected an information systems ethics to have developed as part of the parent IS discipline. However this does not appear to have happened, hence we argue that the consequences of this gap should be explored more thoroughly in terms of the implications for the IS profession, both in education and in work practice.

IS is often characterized as a young discipline concerned with the reflexivity between theory and practice. CE is an equally young discipline addressing similar issues concerning the social and ethical contexts of information systems, information and communications technologies (ICT). Given the relative fluidity of definitions of the respective disciplines, and given the intersection of interest, it is surprising that they have grown up quite so independently. As (Walsham 1996) notes, papers in IS journals often mention ethical issues yet they rarely focus on such topics in terms of explicit ethical concepts and systems of ethics, nor do they tend to cite CE research explicitly, although there are some attempts to integrate ethical reasoning into systems methodologies which we discuss below. However there are a number of, mainly quantitative, studies of IS professionals' attitudes to ethical issues which have been reported in the IS and business studies literature. Walsham's criticism of the lack of ethical development in IS does not appear to focus on such work. Nevertheless, as we shall discuss below, statistical surveys of ethical beliefs tend to deflect interest away from ethical theory and theorizing, taking definitions of ethics for granted in their quest for mathematical certainty, and focusing ethical behaviour into ethical decision making.

Similarly CE research rarely references mainstream IS research. A certain amount of CE writing is philosophical and abstract in inspiration, e.g. (Floridi 1999). At the same time there are many practical case studies and good philosophical approaches towards relevant writing, e.g. (Tavani 2004). However there does not appear to be a preponderance of quantitative studies, so popular in the North American management literature, appearing in the CE literature; philosophical analysis and case studies are much more common. This implies a certain amount of incommensurability in the ethics research paradigms of IS and CE which may go a long way towards explaining why the two disciplines have developed separately in the first place.

A number of implications spring from this separation. The tendency of quantitative IS studies on ethics to focus on ethical decision making as the most significant activity in the business of behaving morally means that other aspects of moral behaviour are overlooked. A second, significant, implication is the difficulty of integrating ethical practice into IS development. This is manifest initially in terms of IS education but later in relation to the development, and use, of IS in the workplace.

The Information Systems discipline is concerned with different activities e.g. Information Systems Development, Information Management and Control, User Educating and Learning, Information Processing and Usability, and Information Strategy (Jayaratna 1994). However, our focus in this paper will be chiefly on Information Systems Development.

In what follows we discuss practice, focusing on ethics and IS practice followed by learning to practice or the business of integrating ethics into IS education. We conclude by offering some suggestions for future directions.

## 2 PRACTICE

### 2.1 Ethics and IS Practice

The development of computer or IS Ethics can be seen as part of the professionalization strategy of the emerging computing/information systems profession (Adam 2001a) where the notion of a “social contract” is important in binding citizens to act in particular ways towards each other and with regard to the instruments and institutions of the state. The social contract takes on additional burdens when applied to professions. A profession has particular duties towards its users and a wider public not only to do them no harm but also, more positively, to act in their interests according to the dictates of the profession. The IS profession, in subscribing to codes of ethics, attempts to enter into a similar social contract. Yet, it can be argued, that the IS profession hardly matches any of the traditional indicators of professional status e.g. standard education, professional autonomy, regulatory bodies etc.

It has been argued (Adam 2001a), that moral reasoning in Computer Ethics tends to follow traditional utilitarian and deontological moral reasoning, and thus criticisms of these traditional ethical theories may be relevant to Computer Ethics. Critics (Tong 1993; Adam 2001a) have commented on the way that traditional systems of ethics, particularly those based on Kantian theories, presuppose a rational, individual moral agent, who can select amongst a set of abstract principles of justice which are available *a priori*, those principles which should apply in a given situation. The individual moral agent is the free man of traditional liberal theory, making decisions on justice and rights unfettered, in his decision making, by the nexus of societal relations. More recently, the emphasis has shifted to power relations in relation to ethics (Tong 1993; Robinson 1999).

The literature on ethics and the teaching of ethics contains many rule-based approaches to ethical practice, many of them focusing exclusively on decision-making. Scientific management approaches have traditionally characterised management activity as the rational pursuit of a goal through decision making. Such a view has been extraordinarily tenacious stretching from Taylorism, through Simon’s later work on the scientific management of human problem solving, and even into views of intelligence as rational problem solving encapsulated in artificial intelligence and related approaches to knowledge management (Simon 1976). Later approaches towards the characterization of decision making in scientific management have included the Theory of Reasoned Action (TRA) and, more broadly, Rational Choice Theory (Archer and Tritter 2000). Such approaches impose a mathematical model on the business of making decisions, often with weightings. Writing on CE, even where it recognises the value of using different theoretical lenses, tends to emphasise the importance of decision-making at “moments of truth” (Mason 1995). Support for decision-making has been offered through case studies and discussion, (Weiss 1982; Weiss, Parker et al. 1990), and by rule-based and other structured approaches.

However these rule-based approaches do not always generate a clear-cut decision, and some authors have interpreted the ambiguities involved in terms of a need to resolve conflict between different courses of action. Mason describes the conflict resolution between alternative possible decisions as supersession, where the moral agent selects the ethical principle or principles that are the most compelling in a particular case. Supersession requires an individual to make decisions even when using ethical principles agreed by a collectivity, such as the Codes of Conduct defined by professional bodies that we discuss in the next paragraph. Depending on the source for the judgement of which principle is the most compelling, this process involves selecting the higher order ethical principle, and the ability to defend the reasoning by which the superseding principle is chosen (Mason, Mason et al. 1995).

Codes of conduct and practice, as an explicit representation of the social contract, have several goals: to capture the essence of the profession’s commitments and responsibilities, as a basis for ethical decision-making; and to convince the public that the profession is capable of self-regulation (Walsham

1996). This social contract between a profession and society can be seen as a transaction of the accountability of the profession and its members in return for the trust, confidence and respect of the public with associated increased social and economic rewards (Mason, Mason et al. 1995). Early versions of the codes of bodies, such as the ACM, tended to be regulatory, but in the 1990s these codes become more normative in nature. Gotterbarn sees normative codes as reflecting some sort of consensus of the traditions of a particular profession, in other words the move from regulatory towards normative signals a growing sense of maturity in a profession (Gotterbarn 1997). Whilst codes of ethics are seen to provide useful sets of principles and duties, several IS researchers have highlighted the difficulties that practitioners may have difficulty in applying them (Anderson, Johnson et al. 1993; Mason, Mason et al. 1995; Walsham 1996).

## 2.2 Methods and methodologies

An important strand of research and practice into “better” IS development is that of IS development methodologies (ISDMs). However, research into the use of ISDMs by practitioners indicates that in many cases they are not used at all (Chatzoglou 1997); that where they are used, they are adapted to the exigencies of the problem and development situations (Fitzgerald 1997); and that in some cases the goal of using them may be displaced to legitimizing the development process, what Wastell calls a social defence (Fitzgerald 1996; Wastell 1996). Therefore we can see that practitioners’ responses to methodologies combine ignoring them with using them in their own way or for their own purposes – in short, difficulties in aligning theory and practice. Commercial methodologies, often adopted by virtue of a decision to purchase a Computer Aided Software Engineering (CASE) tool, are generally focused on a technical rationality, with recognition of the need to align with business needs and be usable by end-users, but little or no recognition of wider ethical issues raised by consideration of stakeholders beyond rational views of client, developer and user, e.g. Rational Unified Process (RUP) (Kuntzmann-Combelles and Kruchten 2001). As we explore later, even methodologies that take account of social aspects do not generally include explicit tools and techniques to support ethical analysis.

“An information systems development methodology is an organized collection of concepts, methods, beliefs, values and normative principles supported by material resources.” (Hirschheim and Klein 1995).

By including “beliefs, values and normative principles” in their definition, Hirschheim and Klein hint that the adoption of a particular information system development methodology (ISDM) may have an effect on the analyst’s treatment (or not) of ethical issues. It is recognised that methods based on a technical rationality, e.g. SSADM (Goodland and Slater 1995), pay minimal attention to ethical issues (Walsham 1996; Rogerson, Weckert et al. 2000). Paradigmatic analysis has revealed the extent to which different methodologies facilitate the consideration of ethical and social issues e.g. ETHICS (Mumford 1996), Soft Systems Methodology (SSM) (Checkland and Scholes 1990), Multiview (Wood-Harper, Avison et al. 1985), the collective resource approach (Ehn and Kyng 1987) and critical action research (Jonsson 1991; Walsham 1993; Jayaratna 1994; Hirschheim and Klein 1995). Even those methodologies that encourage the analyst to raise ethical issues offer limited support for the resolution of these issues. In his exploration of the support offered by SSM to the analyst as moral agent, Walsham provisionally concludes that the degree of support offered by SSM depends on the analyst’s own actions, and the particular adaptation of SSM adopted by the analyst (Walsham 1993).

There is a small body of literature on the role of ethics in systems development, an important strand of which looks at the philosophies that underpin various systems development methodologies, and claims that they favour various value orientations, apparent as “design ideals” (Hirschheim and Klein 1989; Hirschheim, Iivari et al. 1997; Iivari, Hirschheim et al. 1998; Klein and Hirschheim 2001). The Speech Act based approach developed separately in North America and Scandinavia, the latter stream being strongly influenced by the Critical Social Theory of Habermas. Whilst Iivari et al. identify a means-end orientation in the research based on this approach, with the IS designer adopting an

emancipatory role, they point out that the emphasis on the intersubjective use of rational communication can also be used to increase organizational effectiveness (Iivari, Hirschheim et al. 1998). Soft Systems Methodology, with its use of *Weltanschauungen*, does offer the opportunity to consider alternative viewpoints (including ethical ones), but its ethical approach depends on how it is used, and specifically how “accommodation” is achieved between these viewpoints in decisions for action (Checkland 1991; Walsham 1996; Iivari, Hirschheim et al. 1998). It seems, therefore, that methodology is no guarantor of ethics, the change agent(s) and the problem situation also affect the process of making ethical decisions. We should also recognise that methodologies are adapted and combined in use (Mingers 2001).

With so little guidance on ethical issues from standard IS development methodologies, two possible approaches are to enrich methodologies with ethical tools and theories, and for practitioners to comply with professional codes of ethics and to try to combine these with IS practice. In the first example, Wood-Harper et al. take the view that there is a dominant ethical belief that can help to predict and understand group behaviour in a given situation, whilst also considering the various, possibly conflicting, stakeholder ethical views. The analyst must choose a methodology, and decide how to analyze and resolve conflicting ethical viewpoints. In order to do this, the analyst should understand and be able to apply ethical theory. They offer a five step ethical analysis approach, that they claim might be integrated into any systems development methodology, and they then retrospectively map that approach on to Soft Systems Methodology (SSM), the methodology that was actually applied in their case study, (Wood-Harper, Corder et al. 1996).

In the second example, Rogerson et al. attempt to map the Australian Computer Society’s Code of Ethics (ACSCE) on to Structured Systems Analysis Design Method (SSADM), on the basis that such a mapping onto a technically-oriented systems method is a good test of the possibilities for enrichment of methodologies with ethical analysis. Their initial approach covers a mapping of ACSCE on to SSADM modules, and an example of how ACS articles might be used to derive (ethical) product criteria for SSADM products (Rogerson, Weckert et al. 2000).

### 2.3 Reflective Practice

The increasing maturity of the profession tends to place more complex intellectual demands on practitioners who must try to be ethical, rather than make ethical decisions, without the comfort of prescriptive rules that identify good outcomes. In his justification for educating reflective practitioners, Schon rejects the epistemology of technical rationality that understands professional knowledge as the application of science to the adjustment of means to ends. He recommends reflection-in-action, where practitioners think about what is happening, also about *how* they think about what is happening, as well as reflection-on-action, for this reason:

“We reflect on action, thinking back on what we have done in order to discover how our knowing-in-action may have contributed to an unexpected outcome” (Schon 1983), p. 26.

## 3 LEARNING TO PRACTICE

Wright claims that education is the best means of developing good ethical behaviour in the modern business environment (Wright 1995). However a recent statistical survey found that in terms of the ethical values the survey examined, there were no significant differences between business students who had taken an ethics course and those who had not ((Peppas and Diskin 2001).

Additionally, these findings are borne out, at least to some extent by the studies referenced in Wright’s literature survey on learning ethical behaviour and judgement where results were mixed to say the least (Wright 1995). This is a disturbing finding, suggesting that our attempts to incorporate ethics into the curriculum may be to little avail. Peppas and Diskin (2001) argue that case studies could help simulate the experience of exposure to business circumstances and may therefore be more effective

than teaching abstract principles. This echoes the concerns of other commentators (Johnson 1994) who note that systems of ethics, even the more hands-on “ethics of care”, are notoriously difficult to apply.

Much of the empirical research into ethics in IS and business involves quantitative surveys on ethical decision-making, thus constraining our understanding of what it means to be ethical (Adam 2001b). In many studies of ethical decision making the main research tool is the questionnaire followed by statistical analysis, a standard quantitative research approach that predominates in North American management research. It also reinforces an approach to business and management, echoed in IS and computing, which focuses on decision making as the primary thing that managers do. However, for ethical analysis the effect is to take a “snapshot” of the ethical event, to focus on actual decisions that respondents would take, or at least the decisions they say they would make under the circumstances outlined in the questionnaires (Kreie and Cronan 2000). Apart from our concerns about the value of such an exclusive concentration, this also raises the age-old problem that we do not know how to correlate what people say with what they do. More importantly, this style of research has three important consequences. Firstly, it assumes that there is a “right” answer that is clear from the brief description of the case. Secondly, it forces considerations of moral behaviour into the end process of an ethical decision, de-emphasizing or ignoring the complexities of the process and context within which the decision was made. Thirdly, it ignores the way that much, if not the majority, of moral behaviour is not concerned with making decisions. Making good decisions may not be all there is to being “good”. Hence the effectiveness of ethics education is as much about providing the opportunity to reflect on accountable, ethical practice as about learning codes or theories and emphasizing decisions based on such theories.

In the education and practice of systems analysts, information systems development methodologies (ISDMs) are typically used as normative devices to encourage “good practice”. (Klein and Hirschheim 2001) Where ISDMs operate as methodologies as static rule-systems that require developers to operate in a standardized manner, they offer poor support for learning compared with second order learning processes that provide a framework within which individual learning can take place (Floyd 1987).

The difficulty of turning abstract ethical principles into teachable moral procedures is, perhaps, to be expected, for any discipline, not just for IS and IT/computing. The teaching of ethics and systems development, both activities that require the understanding and change of complex social and organisational environments, should recognise the situated nature of the learning needed to practice in these areas, and seek to facilitate students’ development of postformal reasoning in thinkers who appreciate:

“that the intersections of expert knowledge, imagination, and ethical decision are governed by a postformal stage of reasoning, that is, a way of thinking allowing for multiple and contradictory views of truth, for bridging across belief systems, and for bringing to the foreground subjective and self-referential thought.” (Lee 1993).

Postformal thinkers do not rely solely on propositional knowledge but can also use self-referential and subjective knowledge in their consideration of wider issues, guided by the compassion, responsiveness and responsibility that are the hallmarks of an ethics of care. They can connect hypothetical situations to their own experiences, and still consider the other. Achieving this is a tall order.

We recognise the role of critical reflection in students development as reflective practitioners who can challenge the validity of presuppositions in their prior learning, leading to transformative learning (Mezirow 1990). Critical Reflection informs understanding and action in uncertain, poorly defined situations, dealing with diverging values, norms and interests (Wals and Jickling 2002), and encourages consideration of the wider environment in which we operate, e.g. the community and the wider society, by *listening*, (Welton 2002). Not only does reflexivity look outwards, it is also a classic means of connecting theory and practice (Schon 1983).

## 4 DISCUSSION

Ethics has a rich theoretical base that is now steadily being brought into the domain of computing and IS, yet much of the examples of ethical analysis of the IS domain concentrates on decision-making rather than adopting a situated view of practice. In addition, the traditional ethics that acts as a cornerstone for computer and professional ethics creates a tension with its focus on the individual moral agent, assuming that all have an equal chance to speak. Given the movement towards user participation in IS this focus is problematic. Methodologies such as SSM recognise the multiple stakeholders views that can be taken in any given IS but the “goodness” in every sense of the word of the resulting IS or organisational change relies on the way the methodology is applied, the circumstances in which the change takes place, and the relations between the moral agents in the situation under consideration,

Although, in this discussion we recognize the role of the ethical code in formalizing the social contract between a profession and the public, we note that much of that social contract is tacit, not written down and not strictly enforceable. This is especially the case in the computing/IT/IS profession where most practitioners practice perfectly well without reference to professional membership and one need not be licensed in order to practice. This reinforces Gotterbarn’s (1997) point. It is not so much that the codes of ethics strictly lay down rules for the profession to follow, rather that they reflect the maturity of the social contract into which the profession has developed. This maturity can be compared with the situation in ISDMs where the technical rationality of methodologies such as SSADM has been critiqued, leading to the use of approaches that recognise complexity, the plurality of views and the power differences that exist in social and organisational use of IS. The concept of “good” in an IS development methodology rarely maps on to what is understood by “good” in a moral sense. We regard this separation as problematic. It is as if the goodness of ISDMs is to be understood in functionalist terms rather than moral terms and further underlines both the apparent separation of ethics from other parts of life and the lesser status of ethics within disciplines. We welcome the two examples of enrichment of ISDMs with ethical tools and theories but note that these require empirical testing. We look forward to case studies of applications of these enriched methodologies. In neither of these examples has an “ethical” methodology been identified then explored in practice, but the mapping between a practice case study and a methodology, in the light of ethical theories, may be a useful activity in ethics education. Systems Development methodologies have been claimed to offer a useful learning framework for novice system developers, making explicit activities and decisions that more experienced developers may treat as a matter of course. Case studies in ethics education have the attraction of being a safe “sand pit” where novices can experiment with ethical decision-making, digging and building without doing any damage. However, it seems premature to rely on the ethical approaches/methodologies above in our teaching when they have been neither used in anger nor subjected to empirical research..

An additional difficulty lies in the tacit and persistent acceptance scientific approaches such as TRA and supersession, even when supported by Codes of Conduct and Practice. There are a number of problems with such decision-making processes. They describe an “ideal” situation that is very unlikely to exist in real life, whereas a decision may have to be made swiftly and against a messy backcloth of conflicting parameters that do not readily map onto sets of ethical principles amenable to priority rating. Their reliance on the power of the code of ethics and rationalist goal-centred approaches in ethical decision making is problematic if we welcome the advent of more anthropological and interpretive approaches towards recording management and workplace behaviour. This serves to emphasize that although codes can help rule out unacceptable decisions, they are not prescriptions for action. This is partly because, in real-life contexts, different principles and duties may be in conflict, but also because, especially in more recent forms, ethical codes tend to display the “open texturedness” we expect from a good rule, where all the states to which the rule applies are not written down in advance (they cannot be). Rather the rule is subject to interpretation in each new case,

much as in the manner that legal rules are constantly reinterpreted in new legal cases, thus building up the body of case law.

What is it that we do when we act morally as IS professionals? We think it is doubtful that we apply rules in a conscious way in acting morally. The concept of a rule implies that there is a potentially correct answer or decision or set of decisions that can be chosen. Therefore there are two further issues to consider; first the construction of techniques which can be used to choose rules to decide between ethical alternatives; second the related characterization of ethical behaviour in IS in terms of decision making. On the first point, an emphasis on rule following, and concomitant decision making, as encapsulating moral behaviour in relation to IS can lead researchers into developing difficult and potentially convoluted ethical methods which are difficult for teachers to teach and for students to apply.

#### 4.1 Teaching Ethics

If the teaching of ethical methods in CE education is built round the objective of designing methods to enable the following of professional codes, and applying sanctions if codes are not followed, this leads us to question the especially. Apart from the whole question of the ineffectiveness of professional codes in an industry which is largely unregulated, such a view places far too much reliance on formal processes of rational decision making and rule following, ignoring the question of how far moral activity is directed into activities other than decisions. But, on the other hand, unless we are to admit some sort of methodology such as the Masons', we may have little by way of practical suggestions as to how to teach ethical principles, other than abstract approaches which struggle to connect case studies to ethical theory.

As well as incorporating ethics in methodologies and professional codes, we can include ethics in the curriculum of putative IS developers, e.g. on undergraduate courses, with the hope of encouraging practitioners to become moral agents. However, it is not clear how ethical development can be taught effectively as part of the IS curriculum unless a more adequate means of integrating ethics into mainstream IS is developed. At the moment CE is often taught as a separate subject within the IS curriculum. Whilst this may be better than not teaching ethics at all, it suggests to novice IS students and professionals that ethics and practice are separate and may encourage them to compartmentalize elements of their education.

Our experience in teaching a core undergraduate module in CE to a range of IT, IS and computer science students suggests that this may be happening. Although most students enjoy this module there is always a small group of students, admittedly usually drawn from the computer science and software engineering end of the spectrum, who struggle to see the significance of the material. Their concerns seem to run deeper than questions of teaching quality, relating, instead, to what they, and we, expect to see as a suitable topic in the IS curriculum. Despite the efforts of professional bodies to emphasize the importance of ethics in the curriculum, it often looks like something of an optional extra, a theory that is irrelevant to practice.

One of the most problematic aspects of the separation of ethics from IS education/practice manifests itself in the way that students may avoid asking difficult questions about applying ethics to practice. This is inevitable; they cannot frame such questions if they have no obvious means of connecting ethics and practice and where the majority of the curriculum is taught without reference to ethics. How can they integrate what they have been taught in CE with what they have been taught about systems methodologies? There is already evidence that students or new graduates find it difficult to integrate ethical awareness into the workplace.

Although this might suggest that earlier ethics training is needed, we argue that it is just as likely that novices in the workplace have little idea of how to integrate ethical practice into their work even if they have been taught ethics. This problem is unlikely to be stemmed by earlier training, unless it explicitly addresses practical methods of application and integration.

Teaching codes of conduct, including an awareness of how and why these have changed through the years, is therefore important. Although codes are by no means the only topics taught on CE courses, they do, however, form a convenient peg on which to hang the topic of professionalism. Yet too sharp a focus on ethical codes may prove problematic. Rules, whether good or bad, do not carry with them instruction booklets as to how they should be applied. We have the legal profession to help us apply legal rules, mathematics teachers to help us apply mathematical rules, at least until we become expert in the application of mathematical principles. Therefore we should not be surprised if ethical rules are difficult to apply, and we should expect that ethics be taught by teachers who can understand ethical theories and apply them to the information systems context.

In summary, the point we make here is that teaching codes of conduct, especially if they are taught as part of a separate professional studies or ethics module, tends to move the focus of information systems ethics teaching and practice away from real life practical action towards more abstract rules. It then becomes difficult to turn these abstract rules round to apply to practice. Despite this we recognise that rule-based approaches give students a starting point for ethical reasoning on which they can build a critique and hence they may be useful for novices to enhance student understanding of individual methods to improve their choice and adaptation of them in practice

## 5 CONCLUSION

In this paper we have raised a number of issues relating to the connection, or lack of connection between IS and CE. These disciplines have shared concerns: they seek to align social and technical concerns, and theory and practice; such goals are inherently difficult; they seek to influence practice through education; and research methods are moving from quantitative to qualitative.

Our primary concern is with the integration of ethics into IS education, an endeavour that remains problematic, for reasons relating to the curriculum, to the dominant theories espoused by teachers, and to the inherent difficulty of learning to reason ethically in practice. We recommend that, as is usually the case, where ethics is taught as a separate subject, the curriculum be changed to integrate ethics with practice, for example in systems analysis or in reflection on information systems development. We also note that the teaching of CE tends to follow traditional Kantian ethics in emphasizing the ethical decision making of supposedly individual moral agents, whereas we recommend the inclusion of an ethics of care that encourages the connection of individual experience to consideration of that of others, within the context of self-referential and subjective thought. We recognize how difficult it will be to achieve the development of such ethical thinking in undergraduates (and in us, the teachers), and look forward to a body of qualitative research in this area, that can transcend the limited view of ethical reasoning as judged by decisions that follow from a rational process, provided by the body of quantitative research to date.

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