

DEFECTS, USEFULNESS AND USABILITY OF ETHICS THEORIES IN IS ETHICS EDUCATION

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Abstract: Computer ethics is recognized as an essential component of information systems curricula. However, little is known about how students perceive the usefulness and usability of ethics theories in solving computer-related moral conflicts, and what kinds of mistakes they make in solving moral problems by applying those theories. To fill this gap, an interpretive qualitative and quantitative study (n=20) was conducted to determine the defects, perceived usefulness and usability of alternative ethics theories (utilitarianism, Kantian ethics, virtue ethics, *prima-facie* principles, Rawls' veil of ignorance) in computer ethics teaching. The results shed a new light on the use of these theories in this field of education, and also suggest new directions for it.

1 INTRODUCTION

The need of properly educating IS users in ethics has come to be increasingly recognized. As a result, IS ethics education frameworks have been proposed (e.g., Davison, 2001; Dyrud, 2002; Martin & Huff, 1997; Tavani, 2001). These frameworks represent conceptual-analytical reasoning, and therefore lack empirical evidence on their usefulness. Although, the construction of conceptual-analytical IS ethics frameworks is a valuable activity (cf., Hare, 1985), there is also a strong need for empirical research. It would be important to know what effects and implications different theories of ethics have, when used in the IS context. In particular, there is a need to study how end-users experience these theories of ethics, and how these theories affect their thinking, in order to ensure that such frameworks have effects beyond a desktop discussion among researchers. As a response to this challenge the applicability of the universality thesis (favoured e.g., by Kant, Hare) has been empirically studied (Vartiainen and Siponen,

2003). However, in addition, there is also a need to explore users' perceived usefulness and ease of use of other theories of ethics in computer ethics educations. The aim of this study is to do this by exploring the usability of virtue ethics, utilitarianism, *prima-facie* principles, Rawl's veil of ignorance and Kantian ethics.

This paper is organized as follows. The second section presents the theoretical framework, the third considers the research design and the method used, and the fourth presents the results. The fifth section discusses the limits and the significance of the findings. The sixth section reiterates the key findings.

2 THEORETICAL FRAMEWORK

2.1 Ethics theories

Several alternative theories of ethics exists, including utilitarianism, universal prescriptivism (Hare, 1981),

Kant's theory (1993), emotivism (Stevenson, 1944), intuitionism (Ross, 1930), the theory of information ethics (Floridi, 1999) and virtue ethics. Of these theories we selected utilitarianism, virtue ethics, intuitionism (Ross' *prima-facie* principles), Kant's ethics and Rawls theory of justice ("veil of ignorance"). By taking this selection, we aimed to offer students a variety of thinking-tools together with knowledge of the major traditions in ethics. Students were lectured on the basics of ethics theories using the following moral conflict as an example: A friend asked a student if he would lend him the installation diskette of a text processing software program so that he could install it in his own computer. The friend is also a student and he is about to fail a course he is taking if he does not complete a given assignment in time.

Utilitarianism. Utilitarianism, originally developed by Bentham and Mill, holds that an act that produces the greatest happiness for greatest number of people, measured in terms of 'pleasure' and 'absence of pain', is a morally right action. With respect to the example given above, utilitarianism then counts which alternative produces a greater increase in happiness (and pain): loaning the diskette, or not loaning the diskette. If loaning the software produces more happiness for the lender and his friend than negative consequences (pain) to the software manufacturer, then the act of copying is acceptable in the light of theory of utilitarianism.

Kant's ethics. Kant's ethics can be summarized by his categorical imperative consisting of the thesis of universality (i.e., act only on maxims that you would want to be universal laws), and the rule of human dignity (always treat other people as an end, never only as a means). To give a simple example of how Kant's universality thesis can be applied to the case in question, we should ask whether we would want like to live in society where the copying of SW is allowed. If we answer in the affirmative, then copying of SW is acceptable in the light of Kant's universality thesis and the student could lend the software to his friend.

Intuitionism: Ross' prima-facie principles. According to the theory of *prima-facie* duties (Ross, 1930), humans have many such duties, which are more or less incumbent on us. On some occasions, those duties make conflicting demands on us and we have to determine, which of those duties is the more incumbent on us. In the example case, the student has duties towards his friend, for example, to help a friend in need; but he could also be thought to have duties towards software producers, for example, to ensure the maintenance of a proper environment for software production.

Virtue ethics. According to virtue ethics, when faced with an ethical dilemma we need first to ask

what kind of people we are (or would like to be) in order to select from possible courses of action (Pence, 1993; Macintyre, 1987; Crisp and Slote, 1997). Virtue theory itself does not equip us with good virtues, but leaves the course of action to be chosen to the moral agent him/herself. In our example, the student could deliberate with himself about what kind of a human being, or in this instance, the kind of friend or citizen he is or would like to be. For example, he might decide that as a friend he would like to be helpful but as a citizen he would like to foster a good environment for software production.

Rawls theory of justice: "veil of ignorance". The key element in Rawls' (1971) theory of justice is the so-called veil of ignorance. The veil of ignorance seeks to guarantee fair and just treatment for all members of society. The veil of ignorance is applied in an imaginary negotiation, with the purpose of achieving justice or equality in society. Ideally in negotiations behind the veil of ignorance each participant is unaware of who s/he is, of his/her gender, preferences, profession, financial situation, status, and interests in society. According to Rawls, the process of deciding an issue behind the veil of ignorance is fair and just, because we are then forced to choose impartially (as we do not know who we are in society). However, under the veil, participants know certain facts, such as inequalities. When deciding on the principles to be followed under the veil, each participant also has the right to veto an agreement. Under the veil the least advantaged parties (e.g., disabled people) are protected, because no one knows who s/he will be after the raising of the veil. Rawls' (1971) veil of ignorance is also aimed at solving moral conflicts (Collins and Miller, 1992). When solving a moral conflict, one may arrange an imaginary negotiation behind the veil, during which the participants try to achieve a solution to the conflict.

In our case, the student could imagine a negotiation, in which he, his friend, and a representative of the software producer are present. They (the student, his friend and the representative of the software producer) do not know their identity in real life (hence the term 'veil of ignorance'). They might equally be software producers as students. Given this situation, they try to achieve a consensus relating to the production and delivery of software. A possible resolution, which might be accepted by all parties, would be as follows: every one should be properly compensated for their work and for people on low incomes (e.g., students), software producers should offer discounted licensing fees.

2.2 Technology acceptance model

The technology acceptance model (TAM) by Davis (1989), stemming from a theory by Fishbein and Ajzen (1975) and the theory of planned behaviour (Ajzen, 1991), presumes that use of a system depends on behavioural intention to use that system. Behavioral intention consists of an attitude towards use that divides into two components 1) "perceived usefulness" and 2) perceived "ease of use". Perceived usefulness is defined as: "the degree to which a person believes that using a particular system would enhance his or her job performance" Davis (1989, p. 320). Ease of use is defined as "the degree to which a person believes that using a particular systems would be free of effort" Davis (1989, p. 320). If a system – or a theory of ethics in this case - is perceived as useful, the user believes that there is a positive use-performance relationship, and if one system is easier to use than other systems, users will most likely prefer it to the others.

3 RESEARCH DESIGN

The subjects selected were students on an elective Ethics for Computer Professionals (2cr) course, given at the Department of Computer Science and Information Systems, University of Jyväskylä, Finland. The intervention was conducted during January 2003. 21 students participated the course and 20 of them answered a qualitative questionnaire and 21 a quantitative survey designed for this study.

Students were presented with a real-life moral conflict reported by a computer professional to one of the preset authors. In the conflict, the head administrator deliberates over what to do now that s/he has found out that his/her subordinate has been reading users' emails. The case was put as follows (translated from Finnish into English): "I work as a head administrator of a server and some users have contacted me wondering why the reading-times of their mailboxes have magically changed during the night. Because I was unable to find any sensible reason, I spied on the other administrators to find out what they were up to. I found the culprit, a semi-acquaintance, who was 'peeking' at girls' mailboxes. I know that the person is harmless nerd who, in my judgment, would not abuse any information he obtained. What should I do?"

After presenting the case to the students, the chosen theories (Section 2) were introduced, and a qualitative questionnaire consisting of the following assignments was administered: first, the students were expected to solve the problem by using utilitarianism, Kantian ethics (categorical

imperative), virtue theory, *prima-facie* principles and Rawls' veil of ignorance. Then, they were to assess the usefulness and usability of those theories in solving this moral problem. Additionally, the students were asked to assess whether they would use any of these ethics theories, if they were to confront a similar moral problem in real life. After the course, which included essay writing, seminars and exercises relating to moral problem solving, a quantitative survey was distributed to the students: they were asked to assess the usability and perceived usefulness of each ethics theory and then ethics theories in general on a 1 – 5 scale. For example, to the statement "Utilitarianism is easy to use" the response scale ranged from 1, very strong agreement, to 5, very strong disagreement.

To better understand in students' conceptions in this educational intervention, an interpretive research approach was applied (cf., Klein & Myers 2001). In interpretive research that is qualitative, dependent and independent variables are not defined; instead the focus is on individuals' subjective meanings and how they interact with the world around them (Trauth, 2001). The interpretive content analysis approach of Lacity and Janson (1994, p. 148) was used to analyze the responses. In this approach the contextual circumstances in which respondents frame their answers and the circumstances that influence the researchers' interpretations are taken into account.

Krippendorff (1980) has defined the validity criteria for content analysis: internal validity (or reliability) means that the research procedure will yield the same results regardless of the circumstances of application. For instance, if the research method is reliable, the duplication of the data analysis by another researcher will produce the same results. External validity assesses whether the findings represent real phenomena in the context of the data as claimed. Krippendorff's (1980) external validity has similarities with the validity criterion for interpretive studies proposed by Lacity and Janson (1994 p. 149): they see validity in interpretive research in terms of its acceptance by the scientific community. In other words, if fellow scholars find the research meaningful, the results can be considered valid and worthwhile.

4 RESULTS

Categories of defects in the application of each ethics theory, perceived usefulness and usability of each ethics theory, students' conceptions of the defects of ethics theories in general and the use of ethics theories with respect to the specific given

moral conflict outlined above are presented in this section.

4.1 Defects in the application

For each ethics theory there were some students who applied them inadequately in such a way that we were unable to specify what actually went wrong in their analysis. One explanation for this is that some students answered hurriedly and without paying attention to what they wrote. Other defects we classified into categories, and they are presented next.

Utilitarianism

Category: Long-term consequences are forgotten. This category of responses means that the students only looked at short-term consequences. For example, one student wrote as follows: *“The situation should be solved by means of utilitarianism so that all parties to the situation benefit as much as possible. This would happen in practice by warning that the person who was peeking at emails and the peeking would stop. No other sanctions would be applied.”* In the above extract, the student did not bring out the long-term consequences.

Category: Only takes into account self and the assistant administrator who was “peeking” the emails. In this category, the respondents only took into consideration the interests of the assistant administrator and hence failed to pay attention to the interests of the victims of the “peeking” activity, as the following extract from a student’s response shows: *“... Peeking at emails does not lead to any harm to anyone, so probably the only good consequence is a harmless nerd’s pleasure. ...”*

Category: Thinks that the best resolution should apply to everyone. Utilitarianism is concerned to bring about the best possible consequences for the greatest number of people. This is achieved by applying a cost-benefit analysis, which does not mean that everyone necessarily benefits. For example, according to utilitarianism, it is acceptable to suppress minorities if it makes the majority happy. The following extract exemplifies such a flawed understanding of utilitarianism: *“In utilitarianism morality demands that people act in the way that their acts are followed by good consequences”*

Prima facie

Category: Did not take into account all parties’ preferences. Application of *prima-facie* principles was defective in that not all parties’ preferences or duties were considered. A more profound analysis of duties means that the duties of all the parties involved are taken into account. For example, the following extract shows that the

student took the principles defined by Ross into account, but failed to analyze the duties of the head administrator: *“According to Ross’ prima-facie duties an individual is not allowed to harm anyone by his actions, and when aiming at goodness he should develop his morality. Consequently, the person should stop peeking and put himself morally above such behaviors.”*

Kant

Category: Leaves one party out of account. Kant’s categorical imperative requires universalization of the act under deliberation. When universalizing acts, one should take cognizance of the various parties involved. In the following example, student only considers what one should do and refrains from taking, for example, the girls’ position into account: *“... This being the case, in the light of Kantian duty-based ethics the answer to the question ‘What ought I to do?’ is clearly such that I have to do something which stops the forbidden actions of the other administrator.”*

Virtue ethics

Category: Does not consider own moral development. In virtue ethics one considers one’s own nature, that is to say, what kind of virtues one is seeking to develop in oneself. Some students left this viewpoint out of their deliberations – they stressed the application of certain virtues like honesty as in the following example, but refrained from taking deeper look at character building: *“According to virtue ethics in the situation one should apply fundamental virtues like honesty and rationality. The person who committed the offence should practice good manners from the viewpoint of professional ethics and think about his rational utility...”*

Rawls’ veil of ignorance

Category: Does not look at the problem from others’ viewpoints. Failure to observe the problem from other parties’ viewpoints was hooked in students’ use of the veil of ignorance. The following passage shows how one student did not try to see other parties’ perspectives: *“According to Rawls’ veil of ignorance, the problem should be solved in the way that we put ourselves into wholly objective state outside the dilemma and observe it without knowing our role in the event under deliberation.”*

4.2 Perceived usefulness and usability

Some polarity emerged in the students’ responses to the question about the usefulness and usability of ethics theories so far as both qualities received positive and negative descriptions (Table 1). First, students’ perceptions pertaining to the usefulness and usability of each theory are described. Then, their responses to the survey are presented.

Table 1: Perceived usefulness and usability of ethics theories

	Usefulness		Usability	
	Positive	Negative	Positive	Negative
Utilitarianism	Broadens one's thinking; Supports one's thinking; Practicality and clarity	Rule utilitarianism does not help in making rules; Difficult to assess a good solution	Efficiency	Difficulty in identifying parties and consequences; All pleasures cannot be accepted; Difference between rule and act makes utilitarianism hard to grasp
Kant	Clarity	Impracticality and cruelty;	Simplicity of application; Kantian thinking is near my own thinking	Difficulty in forming rules or laws
Virtue ethics	Useful because it is not simplistic; In accordance with general perceptions	Does not give clear advice		Plurality of virtues and factors; Idealistic approach
<i>Prima-facie</i>	Reasonableness and logicity	Uncertainties	Classification of duties is easy	Difficulties in determining duties and in comparing duties (prioritisation)
Rawls	Broadens one's thinking; Supports one's own thinking		One considers only matters	Complexity

Utilitarianism was perceived as useful by the respondents because it broadened and supported one's thinking and because of its practicality and clarity. It was assessed as useless because of the difficulty of formulating a good solution and because rule-utilitarianism did not help in making rules. Utilitarianism was considered usable by some students because of its perceived effectiveness. For others, utilitarianism was unusable because they saw difficulties in identifying the relevant parties and seeing all the consequences of the alternative actions.

Additionally, owing to the focus of utilitarianism on pleasure and happiness and dividing these among people, one student reported that utilitarianism is not usable because not all pleasures are acceptable (pleasures for the majority could mean harm for the minority).

Kantian ethics was perceived as useful owing to its clarity. In turn, Kant's ethics was seen less useful because of its impracticality and cruelty (the inflexibility of Kantian thinking may lead to straightforward but cruel decisions; for example, this might stem from the case that, according to Kant, telling the truth to a murderer when he asks you where a person he is searching for is to be found.)

Virtue ethics was considered useful because it was perceived as non simplistic and because it was perceived to be in accordance with general perceptions. It was considered not useful because it does not give clear advice. The usability of virtue ethics was criticized on the grounds of the plurality

of virtues and other factors and because of its idealistic approach.

Prima-facie duties were considered useful on the grounds of reasonableness and logicity and not useful because all the uncertainties. *Prima-facie* duties, on the one hand, were considered easy to use because the classification of duties was perceived as easy. On the other hand, *prima-facie* duties were seen as difficult to use because it was difficult to determine what the duties in question were and compare them with each other.

Rawls' veil of ignorance was perceived useful because it broadened and supported one's thinking. It was considered easy to use because it was perceived as considering issues only (behind the veil, each participant does not know his/her real identity).

The students' quantitative assessments regarding the usefulness and usability of ethics theories are summarized in tables 2 and 3. For example, (Table 2, first row), 19,0% of students somewhat disagreed with the argument that "Ethics theories, in general, are useful in solving moral problems."

Table 2 shows that utilitarianism and the veil of ignorance were perceived as the most usable theories as they were considered highly or somewhat useful by 71, 4% (sum of 19,0 and 52,4) and 61,9% of students, respectively. In contrast, Kant's duty-based theory and virtue theory were perceived as the most useless theories: 38, 1% and 38,1% of students, respectively, did not consider them highly or somewhat useful. Table 3 shows that Kant and

Table 2: Usefulness of ethics theories in solving moral problems

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Do not answer
Ethics theories, in general, are useful in solving moral problems.	19,0%	42,9%	19,0%	19,0%	0,0%	0,0%
Utilitarianism is useful.	19,0%	52,4%	19,0%	4,8%	0,0%	4,8%
Kant's duty-based ethics is useful	14,3%	38,1%	4,8%	28,6%	9,5%	4,8%
Virtue theory is useful	9,5%	23,8%	23,8%	38,1%	0,0%	4,8%
Ross' prima-facie duties are useful	9,5%	19,0%	33,3%	33,3%	0,0%	4,8%
Rawls' veil of ignorance is useful	19,0%	42,9%	23,8%	9,5%	0,0%	4,8%

Table 3: Perceived usability of ethics theories in solving moral problems

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Do not answer
Ethics theories, in general, are easy to use in solving moral problems.	4,8%	52,4%	19,0%	23,8%	0,0%	0,0%
Utilitarianism is easy to use.	9,5%	42,9%	28,6%	14,3%	0,0%	4,8%
Kant's duty-based ethics is easy to use	19,0%	38,1%	4,8%	28,6%	4,8%	4,8%
Virtue theory is easy to use	4,8%	28,6%	14,3%	38,1%	9,5%	4,8%
Ross' prima-facie duties are easy to use	9,5%	28,6%	14,3%	33,3%	9,5%	4,8%
Rawls' veil of ignorance is easy to use	28,6%	42,9%	9,5%	9,5%	4,8%	4,8%

Rawls' veil of ignorance were perceived as the easiest to use (57,1% and 71,5%, respectively) in contrast to virtue theory and *prima-facie* duties, which were perceived as the hardest to use (47,6% and 42,8%, respectively). As far as ethics theories in general (the first row in both tables), we found that ethics theories were perceived as useful by 61,9% of students and easy-to use by 57,2% of students in solving moral problems.

4.3 Students' perceptions about the defects of ethics theories

Students' perceptions about the defects of the various ethics theories are given next.

Two students perceived defects in utilitarianism. The first student considered that utilitarianism neglects long-term consequences: "*But utilitarianism does not offer the assessment of long-term consequences, this being the case, the nerd, who appears to be harmless, could continue his actions regardless of being rebuked ... this being the case, the principle of utilitarianism does not function in reality*"

The second student criticized the theory as having too many alternatives to be applicable: "*... The theory provides too many alternatives for me to be able to produce a solution with it alone.*" One student criticized Ross' *prima-facie* duties because the theory does not offer any model for the prioritization of duties: "*... Ross does not offer any particular model for prioritizing duties but 'the duty*

proper is to be found via deliberation.' There are no norms with which to standardize duties."

A student criticized virtue ethics for its impracticality. It does not state how one is to cultivate one's virtues in practice: "*The problem emerges in the case of the example we were given, how do we cultivate these virtues? The most general problem in virtue ethics is how to implement it in practice*".

A student considered it a key problem, when applying Rawls' veil of ignorance, that behind the veil one should be able to "forget" knowledge of personal matters. These personal matters include age, status, etc. The student considered this problematic because it would mean casting off one's identity to be able to have the imagined discussion: "*...This creates such a problem that perhaps an individual's identity and everything that binds him to the 'web of his interests' are not inseparable.*"

4.4 Use of ethics theories in real life

Students were nearly unanimous about the usage of ethics theories in real life. With few exceptions, all students considered that they would not use ethics theories directly, but would rely on their intuitive morality, concluding also that their own thinking was in accordance with one or more ethics theories or that they would unconsciously use some of them. In a typical response, one student considered that s/he would use his/her personal view (intuitively) about right and wrong to solve the problem: "*Most*

probably I would not directly use any theory in solving the problem, because I would not solve the problem theoretically, but I would try to base my activities on my view about what is right and what is wrong. ..." A student considered that knowledge about theories could help in solving moral problems: *"If I confronted the situation in real life, I would not necessarily first deliberate what each philosophical theory would say about the matter or how the theories approach solving moral problems. However, the knowledge about theories can help in solving the problem, although no particular theory would offer any exact resolution...."*

Typically students mentioned theories, which they would use and would not use in the event that they had to use a theory. A student expressed: *"... If I used any of them, I suppose that virtue ethics and the veil of ignorance would be best for me. ..."*

5 DISCUSSION

Limitations. This study entails the following limitations. First, the course the students enrolled in was an elective one and therefore likely to attract students interested in ethical issues. Thus, the results cannot be generalized across all students. Nevertheless, we feel that we obtained a multifaceted understanding about how different ethics theories might be applied by students. Second, since the respondents answered through email they were not anonymous, and may not have answered as frankly as they otherwise would.

Evaluation of results. To guarantee validity according to the criteria presented in section 3, we individually classified the responses into categories. After each author had produced his own separate classification of the respondents' conclusions and inferences, the two classifications were compared. This comparison revealed certain differences. Both authors critically discussed differences and jointly agreed upon the final classifications. This kind of peer-review of the categories, involving discussion of the differences between them reaching agreement about them confirms their internal validity. As for the criterion of Janson and Lacity (1994), where validity rests on acceptance by the scientific community, we can only leave this for the reader to decide. However, we have cited verbatim from the subjects' texts to show evidence for our analysis.

Implications for IS ethics teaching and research. The value of incorporating ethics theories in IS ethics teaching was supported by this study. Ethics theories were considered useful by 61.9% of students and not useful by 19.0%. Theories were considered as easy to use by 57.2% and not easy to

use by 23.8%. The results suggest that students do not abandon ethics theories in solving moral problems, even if they do not consciously use them in real life. In fact, some students considered that the ideas behind the theories were latently present in their intuitive deliberations and that theories provide them with useful thinking-tools. However, as the results show, not all students perceive ethics theories as useful or usable, and thus there is the possibility that those students will ignore ethics theories as an aid in ethical decision-making.

Students' perceptions relating to broadening the base of one's reasoning in the cases of utilitarianism and Rawls' veil of ignorance suggest that use of these two theories develops moral sensitivity, i.e., the ability to look ethically at relevant issues (Rest, 1994).

The results showed that there were misunderstandings about how certain ethics theories should be used and that some of the students' analyses were defective. These defects should be taken into consideration when educating students about ethics theories. On utilitarianism, its main tenet about producing the greatest happiness for the greatest number of people, assessing long-term consequences and taking all parties into account should be emphasized. On *prima-facie* duties and Kant, the emphasizes should be on taking all parties into account, and on virtue ethics, attention should be drawn to the importance of considering one's own moral nature.

Some students perceived the use of ethics theories as complex and unclear, i.e., that theories do not give clear advice. This should be taken into consideration in ethics teaching by pointing out the role of ethics theories in decision-making; that is to say, no single theory is meant to be the sole key but all theories should be used in analyzing moral conflicts. This means that toleration of uncertainty when confronting and solving moral problems should be taken into account in ethics teaching.

The results shed light on the use of ethics theories in real life. In future, the effect of teaching ethics theories on the processes of moral problem solving should be investigated. The populations studied should be extended in future studies.

6 CONCLUSION

Although, ethics is recognized as a vital part of information systems curricula, little is known about whether the users find ethics theories useful and usable in solving ethical problems in computing. In an attempt to redress this situation, this interpretive study investigated the perceived usefulness and

usability of ethics theories and their perceived defects. In general the theories were found to have a positive effect on students' thinking, although they were deductively applied in some cases. The findings will be of use in IS ethics education and future research.

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