

Universality Thesis in IS Ethics Education – An Empirical Study

Tero Vartiainen

Department of Computer Science and Information Systems,
University of Jyväskylä,
P.O. Box 35, FIN-40351 Jyväskylä, FINLAND
tvarti@cs.jyu.fi

Mikko T. Siponen

Department of Information Processing Science,
University of Oulu,
P.O. Box 3000, FIN-90014 University of Oulu, FINLAND
Mikko.T.Siponen@oulu.fi

Abstract

The explosion in the use of computers has strengthened the need to address ethical issues in information systems (IS) education. As a result, several IS ethics education frameworks have been expounded. At the same time, it has been argued that for the purposes of IS ethics education the existing theories of ethics are inadequate. However, little empirical research has been undertaken on the effects and perceived usefulness of such IS ethics frameworks in practice. To improve this situation, an interpretive empirical study (n=79) on the effects and implications of an education programme based on three theories of universality, was carried out. The results suggested that the students mostly perceived the theories to be useful, and that the theories had a positive effect on their thinking. The application of the universality theses broadened the deliberation on the moral conflicts of 58% of the respondents, and 76 % perceived the universality theses to be useful for solving moral problems. One version of the universality thesis was found to be particularly open to misuse.

Keywords

IS ethics, teaching ethics

1 Introduction

The importance of providing IS users with a proper knowledge of ethics has been increasingly recognized. This is evident from the huge amount of IS ethics education frameworks (Kallman & Grillo, 1996; Martin & Huff, 1997; McFarland, 1990; Miller, 1999; Tavani, 2001) and professional organizations (ACM, IEEE). One of the central elements of these frameworks is the utilization of relevant theories of ethics. A few philosophers have argued that the utilization of computers creates new ethical issues, such as the question of who, if any, owns a computer program - and the existing theories of ethics, since they were developed before the advent of the information age, are unable to address such computer use related issues (Gorniak, 1996; Floridi, 1999).

Nevertheless, the current wisdom (in relation to both IS ethics education frameworks and the debate on the applicability of the traditional theories of ethics to IS issues) is based on conceptual-analytical thinking, and therefore lacks empirical evidence. Although, it is worthwhile to construct conceptual-analytical IS ethics frameworks (cf., Hare, 1981), there is an equal need for empirical research. It would be important to study what effects and implication a theory of ethics has, 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 effect on their thinking, in order to ensure that such frameworks have effects beyond desktop discussions by researchers.

This study endeavours to address this gap by testing the applicability and effects of an education programme based on three universality theses, as well as exploring users' perceptions of the usefulness of these theses.

This paper is organized as follows. The second section presents the theoretical framework. The third considers the research methods used. The results are presented in the fourth section. The fifth section discusses the limits and the significance of the findings. The final section reiterates the key findings.

2 Theoretical Framework: Three universality theses

Several alternative theories of ethics exists, including utilitarianism, universal prescriptivism (Hare, 1981), Kant's theory (1993), intuitionism (Ross, 1930), and the theory of information ethics (Floridi, 1999). A common element in theories of ethics is the so-called universality thesis. The different versions of the universality thesis form the core element in, for example, Confucianism (Hansen, 1991), Judeo-Christian ethics (Outga, 1972), Kant's theory (1993), Mackie's theory (1981), Rawls' theory of justice (Kukathas & Pettit, 1990; Pogge, 1989; Rawls 1971), and universal prescriptivism (Hare, 1981). It has also been argued that universality theses are good candidates to IS ethics education, and particularly for end-user computer ethics education (Siponen & Vartiainen, 2002). For these reasons, we selected the three versions of universality thesis as theoretical frameworks to be tested in this study (Table 1).

Thesis	Key references
The Golden rule	Hare (1963)
Mackie's third stage	Mackie (1981)
Rawls' veil of ignorance	Rawls (1971)

Table 1. Three versions of the universality theses.

According to the universality thesis, if I consider whether my action in a particular situation is morally acceptable, I must then acknowledge that a similar act by anybody else in a similar situation would also be also right (e.g., Hare 1981). Three versions of the universality thesis are considered in this study: the Golden Rule, Mackie's universality thesis (Mackie, 1981), and Rawls veil of ignorance (Rawls, 1971). Each of these is briefly outlined next.

The first version of the universality thesis is the Golden Rule. The Golden Rule is found in several religious doctrines, including the Judeo-Christian tradition, Buddhist, Islam, Zoroastrianism, and Confucianism. According to the *Golden Rule*, "One ought to treat others as one would wish them to treat oneself" (Hare, 1981).

The second version of the universality thesis selected here is the third stage of Mackie's (1981) *universality thesis*. Mackie posits three stages of universality. The first stage ensures that irrelevant details do not obscure thinking. Such details include references to persons, groups, gender, nations, professions, skin colour, and similar details not relevant to moral thinking. The same idea can be found in Hare's (1981) and Rawls' (1971, 2001) theories, as well. The second stage requires that we put ourselves in other people shoes. In the case of copying of software, following Mackie's second stage, we would ask if we were the software

developer, whether we would like it if someone copied our software without paying the fee. The third stage, includes the first and second stages, and states that we should also take into account other people's preferences, including our own (Mackie, 1981 p. 93). According to Mackie, these principles followed should be such that one can accept them from both one's own and other's viewpoints.

The third version of the universality thesis, which we selected, is Rawls' (1971) concept of the *veil of ignorance*, which is the key element in Rawls' (1971) theory of justice. The veil of ignorance seeks to guarantee fair and just treatment for all members of society (Rawls, 1971). The veil of ignorance is applied in an imaginary negotiation, with the purpose achieving justice or equality in society. In negotiations behind the veil of ignorance ideally each participant is unaware of who s/he is, of his/her gender, preferences, profession, financial situation, status, and interests in the society. According to Rawls, the process of deciding 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 has right to veto an agreement. In this way 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.

3 Research design

3.1 Research subjects and data gathering

The subjects selected to this study are students on the course Knowledge Work and Its Equipment, at the University of Jyväskylä, Finland. The intervention was conducted during two courses, the first of which was held in November 2001 and it is designed to be taken during first year studies. The second course was held in January 2002 and the participants were Open-university students. 41 students from the first course, and 38 students from the second course responded to both the pre- and post-course questions (n=79 students).

This study consisted of two phases, users' conceptions before and after an intervention. First, the students were asked to solve two moral conflicts (Figures 1 and 2) using their own knowledge. They were asked to send their solutions to these conflicts to a researcher. The question form was mailed to the students on paper. The respondents were then given a two-hour lecture on IS ethics. Johnson's (1997) article on ethics on-line, the concept of the moral vacuum (the inability to extend moral deliberation into the area of computing; amorality in the area of computing), and the relationship between norms, laws, and codes of ethics, were also discussed in this lecture. Moreover, the lecture included a general discussion on moral conflicts in computing, and an interactive exercise during which computer use-related acts were presented and analysed from the viewpoints of law and ethics. Moreover, this lecture included the three versions of the universality thesis with a demonstration how they can be applied. Finally, the respondents were asked to apply these universality theses to the solution of a moral conflict concerning the same cases which they had already solved using their own knowledge, before the lecture. In other words, the same two problems were used in the pre- and post-course questions. In addition, in the post-course form, the respondents were asked to "solve the problems by using any of universality theses presented during the lecture, when you deliberate on how you should act." We also recommended them to give arguments for their resolutions of the problems. The students were also asked to state whether the use of

universality thesis had helped them to solve the moral conflicts, and what they felt about the application of those theses. The students were asked to send the responses to the researcher, after which they would receive two study points for completing the course.

In pre-course questions, students were posed the following problems (Figures 1 and 2).

You own expensive word processing software, which you use in your home computer to do academic exercises and write letters/word processing. Your friend asks you to lend him/her the installation diskette of a text processing software program to him/her so that s/he would be able to install the program in his/her own computer. S/he tells you that s/he is never able to use the university computers, because they are so often occupied. Your friend tell you that if s/he does not install the program soon in his/her computer, s/he will not be able to finish the exercise in due time, and will be unable to pass the course. In the manual of the software in question, the unauthorized copying of SW is strictly forbidden.

Describe how you would act in reality in this situation. Justify your decisions.

Figure 1. The first problem case.

You spend a lot of time in an Internet chat room. You have been discussed there a lot, and you have got to know three persons: A, B ja C. You have never met A, B and C in person, but you have discussed very personal matters with them. Recently you have discussed personal matters with A. However, A's recitals have been contradictory, and because of this, you ask whether A has told you the truth in certain matters. A reveals that, in reality, A is totally different A has told you, B, and C about him/herself. After realizing this, you are very disappointed. You know that B and C would be very disappointed as well, if they knew the truth. However, A writes to you that you should not tell the truth to B and C.

Describe how you would act in reality in this situation. Justify your decisions.

Figure 2. The second problem case.

In post-course the students were presented with the same problems but with the following question: *“Try to solve the situation by using any of universality theses when you deliberate how you should act. Give arguments for your resolution.”* Additionally, to get the students’ opinions about how they experienced the applicability of the universality theses, they were asked to answer the following two questions: 1) *“State if the application of the universality theses helped in solving the moral problem. If so, how? If not, why not?”* and 2) *“Describe freely how you felt when applying the universality thesis. Did it help you or was it unhelpful?”*

3.2 Research Method Used: Phenomenography

To attain an understanding of the change in individuals’ conceptions following this educational intervention, an interpretive research approach was applied (cf., Walsham, 1995). In interpretive studies, the foundational assumption is that knowledge is gained through social constructions, including language, consciousness, shared meanings (Klein & Myers 2001). In interpretive research, 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). Furthermore, an interpretive research method, phenomenography, was applied. Phenomenography was developed for the purpose of investigating individuals’ conceptions as well as a change in individuals’ conceptions in educational interventions. As this study attempts to explore changes following an educational intervention, phenomenography was seen as the ideal research method in the present instance.

Phenomenography as a research method was developed to study human understanding about specific phenomena (Marton, 1992). The aim of the method is to identify and describe qualitative variation in individuals' experiences of their reality. The branch of phenomenographical research, which aims to use the outcomes to help the subjects to learn, is called developmental phenomenography (Bowden, 1995, p. 147). This study is an example of this type of research.

In phenomenography the researcher tries to achieve a so-called second-order perspective about the investigated aspect of reality: the researcher describes the conceptions of a group of individuals - instead of using a first-order perspective, i.e. describing reality directly as in ethnographical studies (Marton, 1981). There is a further distinction between first-order and second-order perspectives and relations. If researcher describes individuals' conceptions at a certain time (T1), he is describing individuals' first order relations, but if he describes a change in individuals' conceptions from time T1 to T2, he is describing second-order relations. When investigating learning, the phenomenographic researcher concentrates on the qualitative change in the way a person conceives of some aspect of the reality in question (Uljens, 1991, p. 99).

People's awareness contains two aspects: a "what" or referential aspect, which corresponds to the object itself and a "how" or structural aspect, which relates to the act (Marton, 1999; Uljens, 1993). The "what" aspect is about to what a mental act is directed. The "how" aspect denotes the different aspects of the phenomenon, which constitute its overall meaning. When an individual learns (e.g., mathematics, physics), s/he starts to deliberate in more complex way, i.e., the structure of his/her conceptions relating to the phenomenon becomes more complex. Learning can be considered as a shift from a less complex structure to a more complex structure (Cope, 2001).

This study aims to attain an understanding about second order relations in students' conceptions relating to the resolution of moral conflicts before and after an educational intervention. A phenomenographical research method was applied such that a content analysis of every student's pre- and post-course responses was conducted to determine possible changes in their solutions, and possible changes in the how those solutions were arrived at. Krippendorff (1980) has defined the validity criteria for content analysis: internal validity (or reliability) means that the research procedure yields the same results regardless of the circumstances of application. For instance, the research method is reliable, the duplication of the data analysed by another researcher will produce the same results. External validity assesses whether the findings represent the 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

First, the responses were analysed by the two researchers separately and blindly to determine in what way the students' reasoning and conclusions were changed. Then the differences between the results of the analyses were discussed, and the categories relating to change in the students' deliberations were formulated by both researchers together. The resulting categories are described in section 4.1. The results of the categories relating to the usefulness of the universality theses are described in section 4.2.

4.1 Categories of Change

The categories of change with respect to conclusions and reasoning are considered next (Tables 2 and 3). Change in conclusion means, for example, that whereas in case 1 a respondent, in his/her pre-course response, agrees to loan the installation diskette, in the post-course answers refuses to loan the diskette (or vice versa). Broadening of a reasoning means in post-course response, for example, that more parties, who are involved in the problem, and who were not notified in the pre-course response are taken into account. If a respondent is considered to have broadened his or her analysis to cover more parties, s/he is expressing a more complex way of consider the moral conflict. Categories 2, 4, and 6, which express broadening of analysis, are each constituted of sub-categories “broadening of a perspective”, and “formulation of a moral principle”. 58% (46) of the respondents showed a broadening of their analysis. This number is calculated from the sum of the number of responses in categories 2, 4, and 6 from Table 2. According to results in Table 3, 41 responses showed a broadening of analysis.

Reasoning ->	Analysis did not broaden	Analysis broadened
Conclusion		
Changed	Category 1 (0)	Category 2 (11)
No change	Category 3 (33)	Category 4 (20)
Obscure	Category 5 (0)	Category 6 (15)

Table 2: Categories relating to change in conclusion in problem 1 (unauthorized copying) and change in reasoning. In parentheses, the number of responses in each category is given.

Reasoning->	Analysis did not broaden	Analysis broadened
Conclusion		
Changed	Category 1 (2)	Category 2 (17)
No changing	Category 3 (23)	Category 4 (12)
Obscure	Category 5 (2)	Category 6 (12)

Table 3: Categories relating to change in conclusion in problem 2 (honesty on the chat) and change in reasoning. In parentheses, the number of responses in each category is given.

Category 1: Conclusion changed, but thinking did not broaden

In this category, the students changed their conclusions to the problem, but no broadening of reasoning was not observed in their responses. One respondent stated in his pre-course answer that he would not loan the software, but after analysing the case with the Golden Rule, s/he concluded that s/he would help a friend who is in need:

I would let my friend use my own computer to do the exercise. I refuse to violate copyright. (Pre)

Golden rule: "All things whatsoever you would that people should do to you, do you even so unto them". I would loan my computer to my friend so that s/he can do the task. [This was my solutions] Because if I were in need I would wish to get help from my friends. (Post)

Category 2: Conclusion changed, and thinking broadened

In this category, the students changed their conclusion relating to the problem and they expressed a broadening of reasoning in their analysis. This broadening was observed in two ways, which constitute the following sub-categories.

Sub-category 2-1: Broadening of perspective

It was observed from the comparison between the students' pre- and post-course responses that in the post-course responses they took more parties into account than in their pre-course responses. When they applied the Golden Rule, Mackie's third stage and Rawls' veil of ignorance they took cognizance, in the case of unauthorized copying, of the producer of software and his interests, and in the case of honesty in chat, the preferences of B and C. In the following example, the respondent expressed a broadening of perspective by taking into account the producer of the software in his/her post-course response:

Most likely I would loan the installation disk for a small compensation. ... (Pre)

If I use Rawls' veil of ignorance for the solution, the solution would be in my view, that I would not loan the installation disc (the parties [under the veil] would be the developer of the software and computer users). Instead, if I use the Golden Rule, I would end-up loaning the software to my friend. However, I would choose the first option, because it feels more just, because the decision would have been made without knowing one's own identity. (Post)

Sub-category 2-2: Formulation of moral principle

It was observed from comparison between students' pre- and post-course responses that in their post-course responses they formulated a moral principle by applying Rawls' veil of ignorance. A respondent considered in his/her pre-course solution to the chat problem that s/he would not disclose A's secret if refraining from disclosing the secret did not harm B or C:

Chat is totally strange to me, so it is very difficult to imagine facing such a situation as that described. Most likely I would act as in the case of real friends: I would not tell A's secret [to B and C], unless its concealment would cause some terrible drawbacks to C and B. (Pre)

After applying Rawls' veil of ignorance, s/he changed his/her conclusion because behind the veil everyone would fully adhere to honesty, and thus he should disclose A to B and C:

I apply Rawls' veil of ignorance. If we imagine ...a meeting where the participants are A, B and C and I, and no-one knows who s/he is in reality, we would end-up with the decision that we should be 100 % honest. This would be the case as no-one would want to be in a position where someone is lying to him/her...so I would tell the truth about A to B and C. (Post)

Category 3: Conclusion did not change and thinking did not broaden

In this category, respondents' conclusions in their post-course answers were the same as in their pre-course answers, and broadening of their perspectives was not observed in them. 31 respondents used the universality theses inadequately to strengthen their pre-course solutions. A respondent considered in his/her pre answer that although copying is illegal, s/he would copy the program for this friend. In his/her post-course answer s/he applied Golden Rule to justify the same conclusion:

In spite of the illegality [of the copying of the SW] I would copy the software for my friend. S/he would use it only for his/her own needs. Companies pay software licences to software companies and can get along well without a small payment. (Pre)

The Golden Rule: positive version "All things whatsoever you would that people should do to you, do you even so to them". I would hope that my friend would do the same thing [i.e., copy the software] for me, if I were in need of it. (Post)

Category 4: Conclusion did not change, but thinking broadened

In this category, respondents did not change their conclusions but it was observed that their reasoning was broadened. The broadening was observed in the following two ways.

Sub-category 4-1: Broadening of perspective

In this sub-category, the respondents took the more involved parties into account. When they used the Golden Rule, Mackie, and Rawls in their analyses, they took the viewpoint of their friend into account in the case of unauthorized copying, as in the following example:

I would lend the installation diskette to my friend in return for payment ... (Pre)

... If I was in the position of my friend, I would accept this way of acting, because I understand that who has bought such an expensive item of software, would not want to give it freely to anyone ... (Post)

Sub-category 4-2: Formulation of a moral principle

Respondents took cognizance of more parties involved in the problem, and they looked at the situation from other persons' viewpoints. The following example illustrates a broadening of the analysis by adhering to the principle of honesty in the post-course response:

In this case I could apply Rawls' veil of ignorance. A, B, C, and I would, beforehand, and with the protection of anonymous network personalities, make an agreement about the principles to be applied in the chat room. Beforehand, we could agree on the procedures applicable if we are to discuss personal issues on the net. In this case, we could agree that if we want to discuss personal issues in the chat, one must stick to the truth. (Post)

Category 5: Conclusion obscure, and thinking did not broaden

In this category, respondents did not express themselves such that a possible change of solution could be observed. No broadening of reasoning was found either.

This is a very difficult case. It is regrettable that such things happens in the chat. In such a case I would probably tell B and C about A. Why should I be on the side of liar, when you can be on the side of two honest people. (Pre)

Would I want people to lie to me? No. However, A lied, so perhaps s/he wants that people to lie to him/her as well. S/he is hardly a worth being trusted. (Post)

Category 6: Conclusion obscure, and thinking broadened

In this category, the respondents did not express themselves in such a way that a possible change of conclusion was observable. However, their reasoning was seen to have broadened, as the following sub-categories illustrate.

Sub-category 6-1: Broadening of perspective

In this sub-category, it was observed that the respondents had taken more of the involved parties into account. In the following example, in his/her first response the respondent considered only his/her friend and him, but in the post-course analysis s/he considered the producer of software as well:

I hate to admit it but I would hand over the disc (in reality I would have no money to buy the software for myself). I know that my friend has no money to buy this software. One must help a friend in need. (Pre)

Golden Rule: I loan the disc, 'cos I would like s/he to be willing to loan the disc to me in similar circumstances. On the other hand, I would not loan the disc, because if I were be the developer of the software, I want people to pay for my efforts. (Post)

Sub-category: 6-2: Formulation of a moral principle

In this category, it was observed that respondents formulated moral principles with the help of Rawls' veil of ignorance. One respondent considered in his/her pre-course response that s/he would recommend his/her friend to purchase the software, whereas in the post-course response s/he considered that s/he would use Rawls' veil of ignorance to determine the rules of the game, or principles which every one should follow:

In the other case I would use Rawls veil of ignorance. A meeting would be arranged with all the chat-participants, where we would agree the common rules [to be followed]. The discussion would take place in the chat room in an anonymous manner, where all parties would participate. We should agree how one should act in chat? Can one lie about his/her identity? What kind of humour is acceptable? When a consensus is achieved, the chosen principles would be put into practice, and the violators of these principles would be removed from the chat.

4.2 Perceived Usefulness of the Universality Theses

The following categories relating to the perceived usefulness of the universality theses were derived (see Table 4).

Perceived usefulness		Number of respondents
Beneficial: 60	New perspective	25
	Put oneself in other people's shoes	5
	Helpful in new situations	1
	Clarifies the issue	6
	Brings justice and fairness	11
	Easy to use, but my own conventions in the final analysis dominates my decisions	4
Cannot say: 7	Both helpful and unhelpful	1
	Can't say	6
Unhelpful: 13	Confuse thinking	3
	Axiomatic	3
	Too difficult	1
	Take into account other people's preferences	1

Table 4: Perceived usefulness of the universality theses.

As seen from table 3, 60 users considered the universality theses to be beneficial. 15 of 60 respondents did not provide any particular reasons why they considered the theses useful. 25 respondents saw the universality theses as offering a new perspective, 5 respondents as helping to put oneself in other people's shoes, 1 respondent as particularly helpful when faced with a new moral dilemma, 6 respondents as clarifying the problem, and 6 respondents as bringing justice and fairness. Finally 4 respondents regarded the theses as easy to use, but their own moral conventions in the final analysis determined their decisions.

6 respondents were unable to indicate whether the universality theses were useful. In addition, one respondent saw the theses as both helpful and unhelpful depending on the situation. In total 13 respondents regarded the theses as unhelpful. Of these 13, 5 were unable to indicate any reason why they viewed the theses as unhelpful. 3 saw that the theses as confusing their thinking, 3 people regarded the theses as axiomatic, i.e., the theses were not new, and thus helpful, and 1 respondent viewed the theses as too difficult to apply. Moreover, 1 respondent regarded the theses as unhelpful because, applying the theses would mean taking into account other people's preferences, whereas this respondent would have preferred to think his/her own preferences only.

5 Discussion, limits and implications of this study

5.1 Limitations

This study entails the following limitations. First, the measurement of pre- and post-course answers captures only superficial perceptions. By using face-to-face interviews, we would be able to gain a deeper understanding of the respondents' views. Nevertheless, we believe that we obtained enough of an understanding to see what effects of the universality theses may have in education. Second, since the respondents answered through email their identities were not anonymous. This may mean that the respondents did not answer as frankly as they might in an anonymous study.

5.2 Evaluation of Results

To ensure validity according to the criteria presented in section 3, we individually classified the responses into categories. After producing our own individual classifications of the respondents' conclusions and inferences, we compared them. This comparison revealed some differences, which we discussed and resolved. We critically discussed the differences between our classifications, and jointly produced the final categorizations. This kind of peer-review of the categories, discussion relating to differences between categories, and 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 provide evidence for our conclusions.

5.3 Implications for IS Ethics Education and Research

31 respondents used the universality theses, the Golden Rule in particular, in an inadequate manner in solving the first problem. They used the universality theses to pay lip service to their earlier (pre) view; and/or only considered one party, often the respondents' friend in the first problem, while failing to recognize the interests of the other party (e.g., developers of the software). Since the results suggest that students easily use the Golden Rule variant of the universality thesis in particular in an inadequate way, a special attention should be paid to explicating the appropriate use of the universality thesis in IS ethics education. It is recommended that other universality theses be used, such as the one by Rawls, where the participants do not know who they are (e.g., student or developer of the software) when making moral judgements. Students' poor use of the universality theses could be dealt with in moral argumentation exercises such as by asking critical questions relating to how they apply the universality theses. For example, a teacher could ask his students if they had left a relevant party out of their analysis.

The observation that students' reasoning broadened suggests that use of the universality thesis in IS ethics education develops moral sensitivity, i.e., the capability to observe ethically relevant issues (Rest, 1994) in students. The results also suggest that respondents' problem-solving strategies become more other-directed or principled (broadening of perspective and formulating moral principles) in nature, which is a mark of the development of moral judgment (Kohlberg 1981; Rest 1994; McNeel 1994).

The variety found in the responses showed that students are not unanimous about the resolution of the problems in question. Thus, these problems are good candidates for

dilemma discussions and exercises in moral argumentation, which have been observed to develop moral sensitivity and judgment (Rest 1994;McNeel 1994).

Because the Golden Rule variant of the universality thesis was often used an inappropriate manner, future research should investigate the applicability of Kant's categorical imperative (a version of the universality thesis), which was left out of this study, in IS ethics teaching. Also, it should be investigated whether efforts to stress the adequate use of the Golden Rule variant of the universality thesis have effects on the inappropriate use of universality theses. Moreover, future studies should be conducted so as to guarantee the anonymity of subjects.

6 Conclusions

This interpretive study investigated whether the use of three variants of universality thesis are useful in computer ethics teaching. 76 % of all the respondents (n=79) regarded them as useful. In general the theories were found to have a positive effect on students' thinking. In particular, the application of universality theses broadened the reasoning about the moral conflicts 58% of subjects. One version of the universality thesis, the Golden Rule, was found to be especially open to misuse.

7 References

- Bowden J.A. (1995) "Phenomenographi research" *Nordisk Pedagogik*, pp. 144-155, Vol. 15, Nr. 3.
- Collins, W.R., K.W. Miller (1992) "Paramedic Ethics for Computer Professionals", *Journal of Systems Software*, (17)1, pp. 23-38.
- Cope C. (2000) Educationally critical aspects of the experience of learning about the concept of an information system. Doctoral thesis. La Trobe University, Victoria, Australia.
- Floridi, L. (1999), "Information Ethics: On the Philosophical Foundation of Computer Ethics" *Ethics and Information Technology*. Vol. 1, No. 1, pp. 37-56.
- Gorniak, K., (1996), "The Computer Revolution and the Problem of Global Ethics" *Science and Engineering Ethics*, Volume 2, No 2.
- Hansen, C., (1991) Classical Chinese Ethics. In Singer P. (Ed.) *Companion to Ethics*, Blackwell, Oxford, UK.
- Hare, R. M., (1981), *Moral Thinking: Its Levels, Methods and Point*. Oxford University Press, UK.
- Kallman E.A, Grillo J.P., (1996), *Ethical Decision Making and Information Technology, An Introduction with Cases*, The McGraw-Hill Companies Inc, New York.
- Kant I. (1993) *The Moral Law: Groundwork of the Metaphysic of Morals*, Routledg, London.
- Klein H.K., Myers M. (2001) "A Classification Scheme for Interpretive Research in Information Systems", pp. 218-239, *Qualitative Research in IS: Issues and Trends*, (Eds. Trauth E.M.)
- Kohlberg, L., (1981), *The Philosophy of Moral Development: Moral Stages and the Idea of Justice. Essays on Moral Development*, Volume I. And Volume II: The Psychology of Moral Development: The Nature and Validity of Moral Stages. Harper & Row, Publishers San Francisco. USA.
- Krippendorff K., (1980): *Content Analysis, An Introduction to Its Methodology*, Sage Publications, Beverly Hills.
- Kukathas, C. & Pettit, P., (1990), *Rawls - A Theory of Justice and its Critics*. Stanford University Press, California.
- Lacity M.C., and Janson M.A., (1994): "Understanding Qualitative Data: A Framework of Text Analysis Methods", *Journal of Management Information Systems*, Fall 1994, Vol. 11, No. 2, pp. 137-155.
- Mackie, J.L. (1981), *Ethics, Inventing Right and Wrong*, London, Penguin.
- Martin, C.D. & Huff, C.W. (1997) "A Conceptual and Pedagogical Framework for Teaching Ethics and Social Impact in Computer Science", Proceedings of 27th Annual Frontiers in Education Conference: Teaching and Learning in an Era of Change. Vol. 1, 1997.

- Marton F. (1981) "Phenomenography – describing conceptions of the world around us" *Instructional Science*, Vol 10, pp. 177-200.
- Marton F. (1992) "Phenomenography and "the art of teaching all things to men"" *Qualitative Studies in Education*, Vol. 3, No. 3, pp. 253-267.
- Miller, K.W., (1999), "Teaching computer ethics using the World Wide Web", *Frontiers in Education Conference, 1999. FIE '99. 29th Annual*, Volume: 2, 1999 Page(s): 12D6/1-12D6/5 vol.2.
- McNeel, S.P. (1994) "College Teaching and Student Moral Development" in Rest J.R., D. Narvaez (eds.) *Moral Development in the Professions: Psychology and Applied Ethics*, Mahwa, NJ: Lawrence Erlbaum Associates, pp. 27-50.
- Outga, G., (1972), *Agape: An Ethical Analysis*, Yale University Press.
- Pogge, T.W., (1989), *Realizing Rawls*. Cornell University Press.
- Rawls J. (1971) *A Theory of Justice*, London: Oxford University Press.
- Rest, J.R. "Background: Theory and Research" In: *Moral Development in the Professions: Psychology and Applied Ethics* (Ed. Rest J.R., Narvaez D.), Lawrence Erlbaum Associates, UK, 1994.
- Ross, D. (1930) *The Right and the Good*. Oxford, UK: Oxford University Press.
- Siponen, M.T. & Vartiainen, T., (2002): "Teaching End-User Ethics: Issues and a Solution Based on Universalizability", *Communications of the Association for Information Systems*, Volume 8, Article 29. Stevenson, C.L., (1944), *Ethics and language*. Yale University Press, New Haven, USA.
- Tavani, H.T., (2001), "Curriculum issues and controversies in computer ethics instruction", *Proceedings of International Symposium on Technology and Society*, pp. 41-50.
- Trauth E.M. (2001) *Qualitative Research in IS: Issues and Trends*, Hershey, Idea Group Publishing.
- Uljens M. (1991) "Phenomenography – A Qualitative Approach in Educational Research" in (Eds. Syrjälä L., Merenheimo J.) *Kasvatustutkimuksen laadullisia lähestymistapoja*. Oulun yliopiston kasvatustieteiden tiedekunnan opetusmonisteita ja selosteita, 39/1991.
- Uljens M. (1993) "The essence and existence of phenomenography" *Nordisk Pedagogik*, pp. 134-147. No.3.
- Walsham G. (1995) "Interpretive case studies in IS research: nature and method" *European Journal of Information Systems*, No. 4, pp. 74-81.