ETHICAL PERSPECTIVES IN THE CYBER WORLD – A COMPARISON OF VIEWS OF IT PROFESSIONALS AND STUDENTS

LYNETTE DREVIN

ABSTRACT:
With the growth in Information and Communication technology (ICT) and the consequently possibilities for irresponsible behaviour by some individuals, more and more ethical concerns emerge. Practitioners as well as the educators of young people have to be aware of these issues. The aim of this paper is twofold: Firstly to report on a survey where the ethical views and attitudes of IS professionals and students on IT/IS issues were determined. Recommendations are made to ICT professional societies, organizations and the academic community regarding their role in guiding individuals to act more responsibly when interacting with and using ICT resources. Secondly the aim is to argue about the value of the aforementioned type of surveys that are done from time to time. For example, what can we learn from the results? How can we utilise these surveys to improve behaviour in the cyber world?

KEY WORDS:
Ethics, cyber ethics, IT professionals, students, ETHICOMP®, responsibility, computer security education.

1. INTRODUCTION
Cyber ethics exists in a fast and ever changing ICT (Information and Communication Technology) environment and it is difficult to keep up with moral and ethical issues. Intellectual property rights, privacy, protection of electronic records, information security issues like viruses, spam, denial of service, identity theft, fraud using computers and so forth, are often reported in the media. These problems have escalated with the possibilities provided by the global networked world that are misused by some people. Spinello (1997) refers to the duality of the ethical challenge in the computer and information age. At the one end we have to deploy the technology in a proper manner to solve problems and add value to businesses and individuals. Information technology, on the other hand, provides capabilities that provoke controversial questions such as accountability, intellectual property rights, security risks and so forth.
Moor (1995) defines computer ethics as:

“The analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology.”

Recently the term cyber ethics came in use to include the impact of the Internet and World Wide Web in computer technology. Tavani (2004) describes four phases of the cyber ethics evolution as a result of the technology revolution: Phase 1 (1950-1960) existed when computer technology was mainly huge mainframes where the impact of computers on society was an issue. Phase 2 (1970-1980) was when personal computers and computer networks evolved and businesses got linked. Privacy and computer crime were specific ethical concerns. Phase 3 (1990-current) is the Internet era where the public has access to loads of information. Ethical issues arise in the form of free speech, anonymity, trust, access to personal information etc. Tavani (2004) refers to the current state where convergence of technologies is experienced as Phase 4. Computers are seen as becoming part of whom and what we are. All previously mentioned ethical issues still exist but new concerns are constantly being introduced by new technologies such as bots with decision making capabilities, nano-computing research etc. ICT practitioners, researchers and academics need to debate and reflect upon these issues.

Langford (1995) states that an ethical problem exists when there is conflict between the demands and pressures present in a given situation and the values of the concerned party. In this light we can identify many situations where such conflict exists. Furthermore the importance of studying ethics in the ICT environment is confirmed by numerous researchers and their work in this area including Gotterbarn, Johnson, Moor, Nissenbaum, Spafford (all in Johnson & Nissenbaum, 1995), Rogerson (Prior et al, 2004), Spinello (1997), Baase (2002), Clarke (1990), Floridi and Sanders (2002) and others. Some researchers work and publish from a value-based (e.g. Christian or other religious) point of view and state that the use of computers is not content-neutral (Huggins, 1994). The worldview that one has should guide a person in order to interact in a responsible and accountable way with ICT resources.

The Centre for Computing and Social Responsibility (CCSR) at De Montfort University, UK, conducts a bi-annual survey, called “ETHICOMP®”, for IMIS (The Institute for the Management of Information Systems) among their members to determine ethical issues and views in IT. They publish the results on their website and in a report to their members (Prior et al, 2004).

A similar survey was done by students of the Potchefstroom Campus of the North-West University (NWU), South Africa as part of a post graduate project. The survey was done among IT professionals working in IT practice in
South Africa and the other group consists of IT students (future IT practitioners). The research question under investigation was to determine the difference in ethical outlook between IT practitioners and future IT practitioners (students), if any. The aim of this paper is to describe the survey and present results obtained on some of the ethical issues. The paper will also reflect upon the value of these types of surveys and state from which viewpoints one can use the results in a normative way. The paper concludes with a summary and some recommendations.

2. BACKGROUND

“Is IT ethical?” This is the title of the ETHICOMP® report that documents views and attitudes of IS professionals to a variety of ethical issues. The CCSR conducts the survey on behalf of IMIS. The respondents are IMIS members from around the world – mainly from the UK and African countries. The findings of the survey show a high ethical awareness among the respondents. However, there are also areas that can be potentially problematic, and therefore need attention. This survey has been repeated every two years since 1998. Comparisons are also made to show the differences over time. Recommendations to organizations, professional societies and academics are then made for improvements in responsible practices in the IS community. The 2004 ETHICOMP® questionnaire was used with permission from CCSR to do a similar survey in South Africa (Prior et al, 2004). The next section describes the methodology used to conduct this survey.

3. METHODOLOGY USED

The 2004 ETHICOMP® questionnaire was altered slightly to address own needs. For example, questions to inquire about knowledge of legislation were added. The survey consists of 8 questions to provide information on the profile of the respondents. Forty six (46) statements regarding ethical issues from different viewpoints were given to the respondents on a Lickert scale format e.g. strongly disagree - strongly agree. Two groups were identified for this project. IT professionals and IT students. The Computer Society of South Africa (CSSA), the Southern African Computer Lecturers Association (SACLA) and the South African Institute for Computer Scientists and Information Technologists (SAICSIT) were approached to be part of this survey to reach IT professionals. Electronic versions of the questionnaire were sent to these professional bodies. Respondents then replied via email. The survey was also conducted among IT & IS students of the North-West University. Students were given paper versions of the questionnaire, which they completed by ticking the appropriate boxes. Fifty six (56) IS professionals returned the questionnaire via email and ninety (90) students completed the paper survey. The respondents could now be compared on the level of current IT practitioners throughout South Africa versus current IT
students which will become tomorrow’s IT practitioners. Comparisons between these two groups against the data from the 2004 IMIS survey was also done in the original project but not fully reported here. The Institute for the Management of Information Systems has members all over the world. We hereby have a basis to compare survey results from over the world.

The statements on ethical issues in this survey are categorized under broad areas and are tested by more than one question from different angles. This is to test the consistency of the responses. The broad areas include the following (Prior et al, 2004):

- The importance of ethical considerations to self.
- Importance of ethical considerations to organizations.
- Intellectual property.
- Use of employer’s computing facilities.
- Privacy and data protection.
- Security.
- Responsibility to users/clients.
- Licensing of professionals.
- Globalization.

The responses were captured and analyzed in a spreadsheet program. The results were documented in a project report indicating the three groups viz, South African IT practitioners, IT students (future IT practitioners) and IMIS members from over the world (Olivier & Van den Berg, 2006). The next section will highlight some of the issues in the broad areas comparing the first two indicated groups.

4. DESCRIPTION OF RESULTS

The 56 IS/IT professionals have job titles such as manager/director, programmer, database manager, system analyst, technician, lecturer etc. Only 2% of the professionals are still students. 35% of the respondents have been working for the same organization for 5-9 years while another 23% have been working for the same organization for more than 15 years. This, along with the fact that 50% of respondents are older than 50 years shows that there doesn’t seem to be much job mobility. The 2004 ETHICOMP® survey shows most of the respondents have been working for less than 4 years (34%). Only 13% have been working for more than 15 years. This indicates more job changes. The students were almost all under 25 years of age.

The following graphs show some of the results that cover the broad areas of concern as mentioned previously. The statistics about the IT professionals are presented in one color and the students’ data in another color.
IT. Professionals: (always first)  
Students: (always second)  

4.1 GRAPHs  

**Figure 1. The importance of ethical considerations to self**  
Around 80% of both IT professionals and students (82%, 77%) indicated that they will refuse to work on a project that they judge as unethical. However, it is interesting that professionals hold this view more strongly than students do.  

**Figure 2. Importance of ethical considerations to organizations**  
By far, the majority of both professionals and students (91%, 87%) think that it is right to work according to a code of professional ethics, but again, professionals hold this ethical view more strongly.
It is acceptable for me to make unauthorized copies of commercial software for my own private use

![Bar chart showing responses to the statement about unauthorized copies of commercial software.](chart1.png)

**Figure 3. Intellectual property**

It is concerning the making of unauthorised copies of commercial software where we find the most striking difference between professionals and students. A large majority (86%) of professionals hold this to be wrong, while over half of the students (54%) seem quite happy to do this.

![Bar chart showing responses to the statement about using employer's computing facilities for non-profit activities.](chart2.png)

**Figure 4.1 Use of employer’s computing facilities (non-profit)**

This shows that both professionals and students think it can be acceptable to use the company's facilities for non-profit activities, but a larger minority of professionals than of students believe it to be wrong.
There is a greater difference between professionals and students concerning the use of the company's facilities for one's own profit-making activities, with a large majority of professionals (84%) holding it to be wrong, over half strongly. By contrast, nearly half of the students (46%) seem not unhappy with doing so.

Most professionals and students feel that the misuse of others people's passwords is not ethical, but professionals feel this more strongly.
My organizations security arrangements are sufficient to ensure that information held on its computer systems is safe from unauthorised access from external sources

Figure 6. Security

What is interesting is the fact that more than 16% of the IT professionals feel that their organization’s security arrangements are not sufficient to ensure that information on their computer systems is safe from external sources. Whether this is due to differences in ethical value, differences in the systems being used or differences in perceptions of the consequences of insecurity, is not known. That 36% of students feel indifferent (the highest ‘indifferent’ score of any table) might suggest that students do not perceive the consequences to be less serious than do professionals. Further research of this is warranted.

Figure 7. Responsibility to users/clients

Most of both professionals and students think it is wrong to cut down on testing effort when a project has problems, but this view is stronger among professionals (89%) than students (73%), and there is a sizeable minority of students (14%) who believe that cutting down testing is valid. It might be significant that no professionals at all strongly agreed with this. Why this is so - for example, the consequences of poor testing might be less serious among students than among professionals - deserves research.
More than half of both professionals and students think that licensing of computer professionals should take place. However, there is a larger minority of professionals who disagree (17.5%), than of students (6.6%), and the reasons for this deserve further exploration.

A sizeable majority of both professionals and students agree with this statement (71%, 79%). The main difference between them lies in the strength of belief, with students happier to take advantage.

These graphs show only some of the statements assessed in the survey on ethical awareness in the cyber world. Comparisons between South African IT practitioners and students (future IT practitioners) can be made in all of the areas. These comparisons can be conducted with the data from the ETHICOMP® surveys which include members from over the world. (This was done in the initial student project).
5. **VALUE OF THESE SURVEYS**

From the above interpretations, it seems that professionals are in general more ethical in attitude than are students except where the licensing of professionals is reported on. This stands in stark contrast to the idealism of students of a few decades ago.

Up to this point we have reported on some of the issues that may appear as ethical dilemmas for IT workers. From the viewpoint of being a member of a professional body of the discipline, it is necessary to understand the code of conduct and/or code of ethics from these bodies. Although IT workers have own ideas on acting unethical, it is necessary for each IT professional to acknowledge the proper behaviour that is expected from him/her and abide by the ‘rules’ as set out in these codes. This should be the normative framework for each individual to assess their actions against. Spinello (1997) refers to different Codes of Ethics and Professional Conduct, such as those of the ACM (Association of Computing Machinery) and the IEEE (Institute of Electronic and Electrical Engineers).

In the academic environment, the curricula content is also prescribed by outside entities such as the government. For example, the academic institutions should have critical cross field outcomes for each program possibility. These include ethical issues from a discipline point of view. From this perspective the student should have a normative framework as to assess his/her actions in the IT (and other) field(s). The lecturers give guidance in this respect.

The question could be asked whether the discipline should take notice of the results from these surveys such as described in this paper. Should the discipline not take into account the actual behaviour of young IT people and acknowledge that changes should be incorporated in our ideas of right or wrong and thereby changing practices in the working environment? These issues remain open for debate. Johnson and Nissenbaum (1995) state that when technology changes, it influences the environment in which it operates and therefore the moral character of the environment will ultimately also be called upon. That calls for ethical analysis and decision-making.

6. **SUMMARY, CONCLUSIONS AND FUTURE WORK**

This paper has described a way of determining the ethical awareness of IT/IS practitioners and students assessed by means of a survey done in 2006. The above results are only examples from a comprehensive survey. The findings are mostly consistent with that of the 2004 ETHICOMP® survey and point to a high level of ethical awareness. There are however areas that can improve. Examples are in the areas of knowledge of legislation, intellectual property violations, responsibility towards employers/clients and security arrangements in organizations. As expected, differences are seen between IS professionals and
students. According to this survey the ethical attitude of professionals is generally higher than that of students. These areas can be used to give guidance to professionals and students to promote consistent, responsible practices.

Some recommendations include:
Organizations can improve their practices by adopting a code of conduct, promoting awareness pertaining to ethical issues in ICT, establishing clear policies regarding responsible use of ICT resources, etc. Professional bodies can also contribute to these efforts by updating their codes of conduct, giving guidance to younger/new members, and keeping the debate alive on these issues.

The academic institutions are responsible for the education of young people and should therefore include these concerns in the academic and research programmes. Students should be sensitized to these issues and be given guidance on how to identify ethical issues and how to make decisions. Furthermore, these issues could be included in academic curricula and students could be given guidance on ethical decision-making and responsible practice. Evaluation should be put into place as to determine whether the efforts are successful. From a value-based or religious perspective an educator will guide a student with specific questions e.g. What is true?, What is worth doing?, Will this software aid in solving the problem?, etc. (Huggins, 1994). These questions will give guidance in other aspects of life as well. The educator can help develop awareness to these and other issues when guiding their computing students. It is important that the individual realises what his/her basis or normative framework is so that his/her actions could be according to that basis.

The value of this type of survey that was described in this paper is that the participants think about the included issues and the feedback can be used in positive ways to stimulate debate, to improve ethical practices and enhance education in this regard. Similar surveys can be done at other institutions for comparative work as well as to learn from each other. Issues that may be further explored are indicated in the security aspect (Figure 6). The responsibility to users (Figure 7) needs further investigation, e.g. to cut down the testing time when an IS project falls behind schedule was used in this survey. Another issue that came to the fore is that of licensing of IS professionals (Figure 8). These and other aspects may be of interest in future research.

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8. REFERENCES


