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# **Developing the next generation of IT Professionals – engaging IT students in the practice of IT Professional ethics**

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## **1 Abstract**

This paper describes the approaches taken to teach IT Professionalism and Professional Ethics to IT students in Sheffield Hallam University. The aim is to help students develop their awareness of the issues around professionalism in IT to the point where it becomes one of their career considerations. We describe how we have worked with three different year groups, basing teaching on IT ethical issues as the core engagement tool. We describe some of the teaching techniques and support tools, and conclude by identifying areas of practice which may be of value to other teachers.

### **Keywords**

Professionalism. Ethics. Values. IT. Teaching.

## **2 Introduction**

The "possibilities of ethical ICT" are likely to remain possibilities rather than realities unless those entering the IT industry do so with some level of commitment to the value and desirability of IT Professional Ethics, and more generally, professionalism in IT. In this paper we discuss how we are responding to the challenge of instilling within our students awareness of, and commitment to, IT Professional Ethics. The paper will describe the development, practice and outcomes of teaching, learning and assessment activities focused upon building IT students' commitment to a professional ethos in terms of their future behaviour, personal development and working practices.

### **2.1 Background**

Students entering a Higher Education institution intent on destinations in Medicine, Law, Teaching or any other recognised profession will understand that in doing so they are making a commitment to a set of professional standards, codes of practice and ethics. This is not the case in Information Technology. It is notable that leading writers (Adams, 2008) (Johnson, 2009) (Quinn, 2011) focus their discussions on explaining and justifying the case for professional status rather than treating it as a basic, established fact. Our experience with new IT students is that their understanding of a future in IT is focused on technologies, skills and employability, but rarely upon notions of professionalism or ethical behaviour.

Information Technology, in the eyes of those seeking to build careers in it, has a degree of fame, if not infamy, about it. It has legends and famous personalities. IT personalities are seen more as role models of entrepreneurial achievements rather than models of professionalism. It is these IT celebrities who create perceptions among the next generation of IT workers of what

will be expected of them and what life working in the industry will be like. Innovative technologies, varied jobs, and being part of a fast moving, global industry are all features which make IT such an attractive and exciting career aim, but these come with other less desirable and potentially damaging features such as a lack of accountability for product quality, and acceptance of irresponsible, unethical and even illegal behaviour as a norm.

The challenge then for those engaged in the process of preparing new entrants to IT is twofold: first to build their awareness and understanding of IT Professionalism and Professional Ethics; and secondly to encourage the transference of that understanding to their perceptions of how they will work and what will be expected of them in their future IT careers. In short, the aim of the teacher and lecturer is to foster in IT students commitment to careers which adhere to the codes of practice, standards and behaviours appropriate to an IT Professional.

## **2.2 Teaching IT Professional Ethics**

In Sheffield Hallam University the teaching of Professionalism has two features. It is distributed across all IT courses, the aim being to achieve a level of integration where "Information Technology" and "Professional" are seen as parts of the same package. Secondly, Professionalism is linked closely and consistently with employability, the message being that professional behaviour and standards are supportive of successful career building. In this paper we will focus in detail on what could be seen as the first, and possibly the most important element of responding to this challenge, that is to generate a realisation among Information Technology students that Professionalism and Professional Ethics are concepts which have a direct and immediate relevance to them. While the supporting literature is excellent, it naturally tends to use as its examples headline cases which are either extreme situations or which relate to the decision making of those leading the global giants of the industry. Our experience is that the study of this material is very effective in creating awareness, along with opinions and indignation, but it tends to reinforce a perception that IT Professional Ethics do not have a direct impact on the behaviour of the ordinary IT worker. The approach developed in a number of our Professional modules is aimed at making the issues real and immediate to each student.

The approaches and methods used differ depending on the level and makeup of the student target group, though the objectives are the same. Post-graduate classes contain students from a wide range of countries and cultures, and there are usually a significant number with IT industry work experience. For Final year Undergraduate students thoughts about careers and work in the IT industry will be growing in importance as they enter the employment market and many will have completed a placement year as well, whereas new entrant students will typically not have thought beyond the technology they expect to encounter in their learning.

## **3 The Case Study**

In this paper we describe how activities such as role play and formal debates are used in conjunction with analytical framework tools to focus student reflection and understanding on what Professional Ethics means to them individually, and the impact it has on their career decisions and future working life. Two analytical framework tools have proved to be effective in

helping students relate concepts of Professionalism and Professional Ethics to their personal career planning. One helps students explore the role of personal and professional values in their career planning. The other examines the wider impact of Information Technology using the four SLEP modalities (Social, Legal, Ethical and Professional). The rationale, content and use of both frameworks will be described in detail.

### **3.1 Year 1 - Revealing the norms of first year IT students with respect to IT Professionalism and Ethics**

The first challenge for staff at SHU is to introduce and investigate the idea of professionalism with first year students studying a range of IT related courses as part of the Professionalism and Communication module. This section describes how a newly devised framework was trialled with first year student teams in this module.

Small student teams of around 4 or 5 members were asked to investigate and report on an IT related issue and to consider the social, legal, ethical and professional aspects of their chosen subject. This task required the development of a number of skills including searching, filtering and evaluating the quality of information from a variety of sources, and synthesising and presenting the outcome of the investigation. Along with tutorials to instruct in the use of search and information evaluation tools we needed to provide a tool to help students investigate their chosen topic from different perspectives and from the social, legal, ethical and professional viewpoints in particular. The tool/framework (Tables 1 & 2) (Keefe, 2012) was developed and used with two general computing tutorial groups over a number of tutorial sessions. In the first session the use of the framework was modelled by the tutor and the question under investigation was;

***'I think it is acceptable to download music files and share with others using P2P software'***

The framework requires students to first of all identify any stakeholders that could be affected by this question. The students were then asked to comment on any issues, positive or negative with respect to a given IT issue, from the point of view of these stakeholders and to categorise them as social or legal issues. Other strands of the framework would lead towards the identification of appropriate professionals associated with the issue and gradually towards the development of an ethical stance.

During the first session the students worked initially in their teams to identify stakeholders, which were recorded onto a master copy of the framework. The teams then discussed the various possible viewpoints, which were captured during a round robin and recorded on the grid. The framework was projected and the tutor recorded the issues raised by the students as positive or negative along with the detail. This approach is similar to that taken when applying an 'act utilitarian' ethical framework. The final framework was very similar to a tutor populated grid based on published research on peer to peer users' ethical stance (Shang, 2008) and conceptions of Napster (Spitz & Hunter, 2003) which was shown to the students at the end of the first session.

During the following weeks the teams ran a shortened version of the first session for their particular issue under discussion and with help from the tutor followed the process modelled in the first session. Due to time restrictions, the students focussed on collecting the social and legal issues for multiple stakeholders. Teams would be responsible for generating the professional and ethical standpoints to be presented in their assignment.

## Results

There were two interesting outcomes from the tutor led session. The first was that with respect to the question;

***'I think it is acceptable to download music files and share with others using P2P software',***

Students who expressed an opinion about the ethics of the statement were generally in agreement with the idea that peer to peer sharing was a good thing despite having identified copyright infringement as illegal. Students who had voiced an ethical viewpoint appeared to align themselves with the peer to peer users, and indeed many of them were currently peer to peer users. Typical comments included 'with peer to peer websites there are more benefits to be gained from sharing than abiding by copyright law'. It seems that the students who participated in these seminar sessions had a relatively simplistic world view in ethical terms despite having the cognitive ability to identify multiple different viewpoints.

This position maps onto Perry's stage 1.

*'Perry outlined a nine-position scheme of intellectual and ethical development in which each stage represented a different set of assumptions about knowledge and values. He begins with a very simplistic world-view in stage 1, in which everything tends to be polarised in terms of we-right-good against others-wrong-bad.'* (Lochrie, 1989)

The second interesting outcome was that first year students were able to generate the different stakeholder positions and viewpoints, but they had difficulty in identifying IT workers, in this case peer to peer application developers, as professionals relevant to the scenario, and tended to identify the record companies and recording artists as the only workers to be classed as Professionals. This difficulty in identifying IT workers as professionals relevant to the issue was also apparent when the students conducted the same exercise on their chosen issue in the following tutorial sessions.

## **3.2 Final Year – Preparing to work as an IT Professional**

The original work to develop the SLEP Analytical Framework took place over the two years preceding its application to the Year 1 classes described above. It was conducted simultaneously with similar work with Postgraduate cohorts.

Teaching of IT Professionalism had been unpopular with students. The module aim was to develop students' employability and professional awareness but for a range of reasons it failed to engage students who generally struggled to understand what it was trying to achieve. The module focused on the process of creating an academic standard discussion paper for an assignment, but with little development of the content and issues. Students were asked to

conduct their research and analysis away from the class. In 2010 a new teaching team restructured and refocused the content.

For the Final Year classes, comprising around 120 students each year, the learning process was essentially delivered in two parts, the first of which was part of the employability awareness teaching. The learning objective for this element of the module was to enhance students' career decision making ability by encouraging them to focus on their aspirations, competences and values. The first two clearly support job-seeking activities. The third acknowledges the importance of personal values in developing career decision criteria. Using a simple assessment instrument based upon the work of Lovell and Fisher (Fisher & Lovell, 2009) we asked the students to consider what aspects of working and employment were important to them in deciding what careers and jobs they wanted to pursue, or to avoid. The Values reflective tool was first used in the context of IT Professionalism with Postgraduate students who responded well to it, as described in the next section.

The Values assessment provided a reference point to the second part of the module which addressed Professional Ethics. The changes introduced were designed to generate engagement in the issues by making the analysis of issues a class activity and by focussing on issues which the students perceived as being of interest and relevance to their lives and career situation. The purpose in changing the teaching methods and learning content was to re-connect students with the module aim of building student's awareness of the benefits, responsibilities and challenges associated with being an Information Technology professional, with the hope that this would lead to personal commitment.

For the class exercise the discussion focused upon an IT related current news item. We found that the important criteria for selecting a subject was that it was something about which the students would have an opinion. Initially debate was unstructured and views expressed were one sided and narrow in focus. The use of the SLEP analytical tool encouraged students to take a holistic view of the issue, to explore the range of opinions, and to consider the implications for those working in the IT industry, that is, for IT Professionals. The results were consistently successful. There was a clear progression in thinking and understanding evident during these class sessions. For example; one popular discussion headline came from the BBC News site, "Why do people play music in public through a phone" (Hudson, 2011), an item specifically chosen for its potential generational bias scope for polarised views. The flow of this and other classroom discussions typically went through four phases:

Initial reaction - expression of personal views, often in defensive or emotional terms;

Analysis - using the SLEP process to take a more holistic view by identifying stakeholders and defining their concerns;

Critical exploration - moving into a more objective understanding of different viewpoints and appreciation of concerns;

Discussion of responsibilities - an unexpectedly successful conclusion in which students discussed the role and contribution of IT practitioners to the issue in question.

At the end of the module each student produced a written paper analysing and discussing an IT related issue of their choice. For the teaching team this was a particularly rewarding exercise as

students consistently exceeded expectations both in terms of commitment to the work, and quality of the end product. Many students went beyond the class content into the philosophical aspects, relating viewpoints to utilitarian and Kantian perspectives for example. In module feedback many students welcomed the opportunity to discuss issues they felt important.

### **Further developments (Final Year continued - ethics in strategic analysis?)**

Recently the SLEP Analytical tool has been introduced to a Final Year Class studying Business and IS Strategy, the aim being to demonstrate it as a useful technique for strategy analysis, but also as part of the process of embedding the teaching of IT Professional Ethics in to mainstream IT teaching. To demonstrate how the process works the contents of the analysis are contained in the tables below. The topic was simply, “is Professionalism in IT important”

#### First Phase Stakeholder perspective (Table 1)

<b>Stakeholder</b>	<b>Concern</b>	<b>Issue</b>
General Public	Misuse of personal data	Low public trust in IT
IT Student	Not a meaningful status	No professional recognition
IT Practitioner	Competing with unqualified jobseekers	Career opportunities and progression
IT User	Reliant on unreliable IT	No controls over IT industry

#### Second Phase SLEP Analysis (Table 2)

	<b>Issue</b>
Social	Low public trust in IT, Society reliant on uncontrolled IT providers
Legal	Data Protection and other IT laws unclear and often flouted.
Ethical	Abuse of trust and specialist knowledge Customer users not always respected
Professional	No formal recognition of IT status Low motivation to embrace professional standards

#### Third Phase – Discussion and conclusions

Although this session was essentially a demonstration, the short discussion which followed indicated that the students had recognised some of the issues as being relevant to them. They pointed out that professional status was meaningless without some form of regulatory authority. They recognised why there should be public distrust in IT and that it related to day to day contacts between IT practitioners and the public, not just those corporate failings usually highlighted as case studies.

### **3.3 Post-graduate**

The majority of postgraduate students at Sheffield Hallam, as with most UK universities, come from overseas, many with extensive work experience, though many are also fresh from the undergraduate studies. The aim of the module is to develop understanding of IT professional

practice and skills. The focus is on professionalism and the ethos of the module is to deliver it in a way which reflects practice in the workplace. Consequently it is delivered as a block week long training course, and includes examples of developmental activities frequently experienced during in-work training, but not the norm in academic teaching.

As with the undergraduate students the approach was based upon students reflecting upon their own attitudes and values in the context of ethical and behavioural responsibilities expected of an IT Professional. Two very different approaches have proved consistently successful over the last three years and 6 occasions that this module has run. The first has been a formal debate aimed like the Final Year exercise described above at getting students to identify and consider different perspectives on an IT ethical issue. The second was intended to help students to recognise a personal relationship between their career aspirations and the professional issues discussed during class. Students were asked to create a role play or other performance which would demonstrate an aspect of IT Professional behaviour in practice. To emphasise the human nature of the subject the event had to be entirely analogue. These performance events have been successful on two levels. First they have clearly demonstrated that students had developed a level of empathy between themselves as IT Professionals and their imaginary clients or members of the public. Secondly the level of engagement to the learning process has been extraordinarily high, particularly bearing in mind the wide range of cultures and nationalities represented in these classes. The lesson might be that to teach concepts as intangible as ethics and professionalism it might be valuable to introduce some fun into the process as we have had presentations which have included drama, mime, song, dance, and one delivered in full Bollywood style.

Student reflection and feedback has again been positive. Statements like *"I could not see the point of this module when I started, but now I think it is one of the most important modules of the course"* are not uncommon. The assessment work submitted after the teaching event indicates a high level of understanding of the learning content, and possibly more importantly, its relationship to future career paths and professional behaviour.

#### **4 Observations and Conclusions**

The title of this paper is "Developing the next generation of IT Professionals – engaging IT students in the practice of IT Professional ethics". In writing it we set out to examine our experience teaching three different year groups with the aim of identifying where we may have been successful in instilling within our IT students a sense of professionalism and professional ethics to go alongside the knowledge, skills and expertise on which they will build their careers. Most of this examination is a reflective account rather than a report of research, but nonetheless we feel our observations and suggestions are valid and, we hope, helpful.

For education colleagues challenged with the task of adding IT Professionalism and Ethics to the career toolkit IT students take away with them into the IT industry, and indeed into the world at large, our reflection points to a number of practices you might consider including in your teaching.

First, a participative approach built around discussion of issues to which the students relate creates interest in the deeper concepts. It was notable that the Final Year groups, having



engaged in topics which they felt were relevant to them, and then moved on the study some of the case studies which they had originally seen as remote and irrelevant.

Second, an analytical framework was valuable on two levels: first, as a classroom demonstrator; second, as a model of the logical flow of thinking along which students could progress.

Third, encouraging students to relate learning to their personal career development ...?. This is something which could backfire if mistimed or done at the wrong pace, as had been the case at Sheffield Hallam. However, we felt there were positive indicators among both the undergraduate final year students and the postgraduates that they were including thoughts about values and professional ethics in their career thinking. Arguably they were already doing this at a subconscious level and it may be that our contribution was to help them articulate their thinking.

In his recent paper on Philosophy in the Workplace Professor Mark Addis discusses the value of philosophical disciplines and thinking to those in traditionally non-philosophical occupations, for example construction (Addis, 2013). While we have not gone as far as to specifically introduce philosophy into our teaching of Information Technology subjects, we have adopted a similar approach for teaching students about professionalism and professional ethics. That is we have attempted to demonstrate that there is a positive value in understanding the relationship between concepts, ethics and professionalism in this case, and occupational behaviour. In examining the teaching of IT Professional Ethics at three levels of study, First Year, Final Year and Postgraduate, we have observed indications of learning and progression from a state of unawareness, through recognition, understanding, engagement and, we believe, to a point where the issue of commitment is acknowledged. We hope this will lead to actual commitment to the principles and disciplines associated with IT Professional Ethics as careers are developed.

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