Proceedings of the
18th Australasian Conference on
Information Systems Doctoral Consortium
Toowoomba, Queensland
4 December 2007

Sponsored by:
IT Professionals’ Experience of Ethics and its Implications for IT Education

Ian Stoodley

Principal Supervisor: Prof Christine Bruce
Associate Supervisors: Assoc Prof Sylvia Edwards, Dr Trevor Jordan, Prof Alan Underwood

Faculty of Information Technology
Queensland University of Technology
GPO Box 2434, Brisbane, QLD 4001
Telephone: +61 7 31382782
Fax: +61 7 31382703
Email: i.stoodley@student.qut.edu.au
IT Professionals’ Experience of Ethics and its Implications for IT Education

Abstract
This research is aimed at developing a framework for preparing and supporting IT professionals as they practice ethics in a complex environment. It complements other research, by focusing on professionals’ own experience and by exploring this experience in depth. Variation Theory and Phenomenography form the basis for this project – eliciting and representing the relationship between IT professionals and the object of their experience, ethics. Participants were invited to participate, based on a ‘Model of Evolving IT’ which maps the IT space along an information-technology continuum and an artefact developer-artefact user continuum. Preliminary analysis has revealed two groups of experiences of ethics, one group defined by the proximity of the beneficiaries and the other group defined by the degree of personal ownership of responsibility. It is anticipated that the result will be a proposal for IT professional ethics formation and support, relevant to professional development and tertiary education.

Keywords
Ethics, Information Technology, Professionalism, Phenomenography, Education

As the distinction breaks down between the human and the technological, as national and cultural borders are transcended, and as technologies converge, IT professionals are presented with an increasingly complex environment in which to practise ethics. This study aims to contribute to the support offered to IT professionals in navigating this complex environment.

This research is designed to complement other research in IT professional ethics, which is mostly guided by ethical theory (such as Kohlberg’s stages of moral development) or which pursues an investigation framed by positivism (such as using statistical analysis of multiple choice surveys).

Previous research
Much previous research into IT ethics starts with an ethical theory, which then drives the analysis. For example, Kohlberg’s stages of moral development are highly favoured for this approach (Davidson, Martinsons, Lo, & Kam, 2006; Kohlberg, 1981; Siponen & Vartiainen, 2004). However, while this theory has offered valuable insight, Kohlberg’s stages have been criticised for being overly justice-oriented, biased towards Western culture and rationalistic (Dreyfus & Dreyfus, 1990; Gilligan, 1982; Snell, 1996; Wardekker, 2004).

Additionally, much research into IT ethics has engaged students as the participant base (see Table 1. Overview of empirical studies of IT ethical decision-making) and while there is reason to believe that this group can be usefully studied for issues regarding professional education, their inexperience and separation from the professional world suggests that insight relevant to professional practice should also be drawn from actual practitioners (Cappel & Windsor, 1998; Prior, Rogerson, & Fairweather, 2002).

Most previous research has also made use of multiple choice surveys, the results of which have been submitted to statistical analysis, and while this is able to represent a numerically broad sample, personal interviews offer an in-depth understanding of IT professionals’ worldviews.
<table>
<thead>
<tr>
<th>Study</th>
<th>Subjects</th>
<th>Instrument</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Banerjee, Cronan, &amp; Jones, 1998)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Cappel &amp; Windsor, 1998)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Ellis &amp; Griffith, 2001)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Kreie &amp; Cronan, 1998)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Leonard, Cronan, &amp; Kreie, 2004)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Morris, Jones, &amp; Rubinsztein, 1993)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Munro &amp; Cohen, 2004)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Paradice &amp; Dejoie, 1991)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Pearson, Crosby, &amp; Shim, 1997)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Prior et al., 2002)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Robbins, 2005)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Woodcock &amp; Armstrong, 1999)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

No qualitative empirical research into IT professionals’ experience of ethics has been found to date, hence this is an area of contribution of this study.

Impersonal data gathering techniques (such as online surveys) are sometimes favoured when investigating such a personal phenomenon because they are said to give a greater sense of anonymity and therefore a higher likelihood of gathering honest responses. However, there are indications that a personal verbal assurance of anonymity reinforced by the relationship built in the course of an interview is actually more effective than anonymity in responding to participants’ privacy concerns (Aquilino, 1994; Smith, Adler, & Tschann, 1999).

**This research**

My research aims to see ethics from the point of view of IT practitioners and from this perspective draw conclusions with respect to offering them support in their practice of ethics.

I anticipate my approach will offer insights into the IT professional world from an insider’s perspective. These insights will be examined to discern critical differences in professionals’ worldviews, with a view to suggesting experiences which could enable an IT professional to attain a comprehensive view of ethics relevant to their professional context.

The theoretical basis for this work is the educational Variation Theory, with the attendant research method called Phenomenography. Variation Theory observes that deep, effective learning occurs when the learner experiences the object of learning in a new way. It has been observed over a range of empirical projects that there are typically a limited number of educationally significant ways to experience any one phenomenon, and that the
more of these experiences a person can enter into, the more mature their understanding of the phenomenon will be.

The range of possible experiences of ethics will be discerned from semi-structured interviews with IT practitioners who represent a breadth of experience within the industry. This breadth of experience is designed to maximise the probability of capturing a wide variation of viewpoint, which it is anticipated will enable a reasonably comprehensive representation of the experience of professionals within the IT sector. This experience of professionals will be compared with the literature, to see how each contributes to the other.

The result will be a proposal for IT ethics formation, which it is anticipated will be of relevance to both the workplace and the tertiary education sector. Thus, my research pursues the question: How can we support IT professionals in their practice of ethics?

Theoretical basis

The educational Variation Theory was developed out of a quest to discover the qualitative advantage of effective learners over ineffective learners. Ineffective learning (also coined ‘surface learning’), for example memorising facts, treats the object of learning superficially and fails to gain insight into its essence, whereas effective learning (also coined ‘deep learning’), for example following an argument, achieves a more profound understanding of the object of learning. The difference has been found to do with the intentions of the learners as they approach the new phenomenon. Deep learning seeks understanding of the phenomenon and phenomenography helps us describe and study that understanding (Marton & Booth, 1997).

Experience of a phenomenon as studied by phenomenography is not about the observer as such (e.g. their psychological state), nor is it about the object of their attention (e.g. its internal characteristics), it is about the relationship between the observer and the object of their attention, see Figure 1. The Relational Nature of Phenomenographic Study (Pham, Bruce, & Stoodley, 2005, p. 219, adapted).

Such an approach to the practice of ethics is different from an examination, for example, of the internal mechanism of decision-making of individuals or of specific ethical issues.

Figure 1. The Relational Nature of Phenomenographic Study

Phenomenography observes that, given a certain purpose, there are a limited number of qualitatively different ways a group will relate to any one phenomenon. It is discerning those ways of relating and describing how they are associated which is the business of phenomenography. This lays a foundation from which a pedagogy based on Variation Theory can be applied.

Modelling IT

In order to understand who to invite to participate in my research, for as wide a variation in experience as possible, I needed to define IT. Traditionally, the technical development of software and hardware lie comfortably within the scope of IT. However, information management is coming increasingly into focus as integral to the IT space. This is reflected in the views of IT researchers, who focus on information as integral to their field of study (Pham et al., 2005) and in IT models which include information (Finkelstein & Hafner, 2002). As such, both ‘I’ and ‘T’ need to be accounted for when considering the scope of IT, and define the endpoints of the IT continuum, represented on the right-hand axis of my model (see Figure 1. A Model of Evolving IT).

Another distinction raised in defining IT is that of artefact developers in contrast to artefact users, whereby artefact development lies within the scope of IT and artefact use does not. This is evidenced in IT researchers’ views when they define their field of enquiry specifically in terms of artefact development (Pham et al., 2005, p.222) and in Freeman and Aspray’s mapping of IT-enabled workers against IT-workers (1999, p.32). In contrast, Finkelstein and Hafner call for “a definition of the IT field that includes not only the technical aspects, but all aspects of IT development and use -- including the technical, cognitive, managerial, social, and economic
aspects" (2002, p.2), and others observe that the developer-end user distinction is becoming increasingly difficult to sustain (Kaarst-Brown & Guzman, 2005). Also, when approaching IT from an ethical standpoint the user is surely brought into focus and therefore a model of IT with a view to ethical study must have the end user in view (Denning & Dunham, 2003). The continuum of artefact developer to artefact user is represented on the top axis of my IT model.

The disciplines in dotted boxes inside my diagram (Information Security, Information Management, Hardware Development, etc) are attempts to situate IT professionals concretely within this space.

In attempting to set limits on IT, I have searched for activities that lie outside these two continuums of information-to-technology and developer-to-user. These activities that lie outside the scope of IT are concerned with information which has no direct application to technology and technology which does not manipulate information. In my model, the disciplines of Mathematics, Sociology, Engineering and Mechanics are attempts at defining the outer limits of the IT discipline, though they may have specific functions within the IT space (Denning et al., 1989; McGuffee, 2000).

From the discussion above, we see evidence for an evolution of attention in IT from the artefact development space into the artefact user space. Thus, mediating roles between the technology and the user have come more into focus and increasingly part of IT, including such services as applications training and support, and knowledge and information management. Previous research has revealed that some IT researchers view the territory in ways that reflect the full scope of this diagram (Pham et al., 2005).

Figure 1. A Model of Evolving IT
Data collection

In keeping with the Model of Evolving IT above, 30 semi-structured interviews have been conducted with a range of practitioners, see Table 2. Project Participants. Participants included those working in software and systems development and support, through technical pre- and post-sales roles, to information management and librarianship.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Heritage</th>
<th>Membership</th>
<th>Ethical training</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>F</td>
<td>&lt;30</td>
<td>31-40</td>
<td>41-50</td>
</tr>
<tr>
<td>21</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>


The interviews were devised in order to move interviewees from their concrete experiences of ethics through to abstract expressions of their experience. Four core questions kept the interview focussed on the participant’s experience of ethics, and the conversation developed from these, according to their responses:

1. Explain what kind of IT work you’ve done and what IT work you do now. Have you employed ethics in your professional life? Describe a couple of these situations.
2. In reference to these examples [3 scenarios supplied pre-interview], are there ethics involved? If so, what are they and how would you respond?
3. When you consider situations like these scenarios and the ones you face yourself, what helps you discern what the ethical issues are and how you can resolve them?
4. In general, what does it mean to you to practise ethics as an IT professional?

The scenarios referred to in Question 2 covered a range of situations of some complexity.

Application

The primary contribution of this study will be a framework depicting different ways of experiencing IT ethics. This framework will enable a comparison of a professional’s view of ethics with the views of others in the profession, which can lead to the kind of broadening of awareness of the individual which is associated with deep learning.

The types of elements emerging in this framework in this early stage of analysis include professionals’ experiences of what ethics is, ranging from fulfilling responsibilities to self to fulfilling responsibilities to the wider world (see Table 3. Findings: What ethics means to IT professionals). These experiences are arranged with the natural connection to the beneficiaries radiating away from the professional with ever-increasing distance (from 1A to 1D).

Table 3. Findings: What ethics means to IT professionals

<table>
<thead>
<tr>
<th>1. What does ethics mean?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Responsibility to self</td>
</tr>
<tr>
<td>B. Responsibility to the client</td>
</tr>
<tr>
<td>C. Responsibility to the organisation</td>
</tr>
<tr>
<td>D. Responsibility to the world</td>
</tr>
</tbody>
</table>
In enacting ethics, professionals’ experiences range from devolving responsibility to others to submitting responsibly to universal principles (see Table 4. Findings: How IT professionals practise ethics). These experiences are arranged with the personal ownership of responsibility spiralling towards the professional (from 2A to 2D).

Table 4. Findings: How IT professionals practise ethics

<table>
<thead>
<tr>
<th>2. How do we practise ethics?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Devolving responsibility to others</td>
</tr>
<tr>
<td>B. Sharing responsibility with others</td>
</tr>
<tr>
<td>C. Bearing responsibility ourselves</td>
</tr>
<tr>
<td>D. Submitting responsibly to principles</td>
</tr>
</tbody>
</table>

Further analysis is needed to confirm and develop these preliminary results and consider connection between them.

It is anticipated that the final framework will assist with ethical formation and support in both the workplace and tertiary education settings.

**Current stage of research**

30 semi-structured interviews have been conducted. Analysis has only just begun, so few analysis results can be reported at this stage. This project is 9 months from thesis submission.

**References**


behavior, reasoned action, perceived importance, or individual characteristics? *Information & Management, 42*, 143-158.


