Understanding Information Ethics and Policy: Integrating Ethical Reflection and Critical Thinking into Policy Development

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ABSTRACT

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Abstract: The development and implementation of information policies must begin with an understanding of underlying values, such from different cultural perspectives and points of view. As Capurro reminds us: "As a self-referential process ethics is an unending quest on explicit and implicit use of the moral code, that is to say of respect or disrespect, with regard to individual and social communication. . . .There is, indeed, no unbiased ethical observer. (Capurro et al. 2007, 21). In her work on ethical warrant, Berghtol has noted the importance of understanding context (Beghtol 2002). Her concept of "cultural hospitality" provides a theoretical framework for the ethical warrant of knowledge representation and organization systems, and it helps in representing new knowledge and organizations systems and for revising existing systems, and the diverse cultures to which each individual belongs. Using these two foundations, this paper provides an overview of some of the critical information ethics issues challenging policy makers in government and in organizations. Then, building on policy frameworks and several models for ethical reflection and critical thinking, the paper will describe briefly a case-based learning approach with a model for critical thinking for a proposed undergraduate course on Information Ethics and Policy.

CATEGORIES AND SUBJECT DESCRIPTORS

GENERAL TERMS

KEYWORDS

Information Ethics, Undergraduate Education, Information Policy

1. INTRODUCTION

1.1 Background and Context

Ethics as reflection on morality is widely accepted among philosopher beginning with Aristotle, the founder of ethics as an academic discipline. As Rafael Capurro, who heads the International Center for Information Ethics (ICIE), reminds us:

> As a self-referential process ethics is an unending quest on explicit and implicit use of the moral code, that is to say of respect or disrespect, with regard to individual and social communication. In other words, ethics observes the ways we communicate with each other as moral persons and the ways this moral identify is understood. There is, indeed, no unbiased ethical observer.[1]

In the rapidly changing environments in which information professionals work and in which iSchool

educators teach, ethical issues are increasingly being raised, demanding attention and efforts toward resolution. Of particular interest for iSchools and the information field are those related to information throughout its life-cycle. Originally called the ethics of information in society, this topic has more commonly been referred to as Information Ethics (IE) [2]. Beginning in 1997, conferences on the Ethics of Electronic Information in the 21st Century were held at the University Memphis [3]. The subject of IE has also gained international interest as demonstrated by recent activities, starting with the first UNESCO Conference of InfoEthics in 1997 [4]. In 2003, an invitational conference was held in Karlsruhe, Germany under the leadership of the ICIE with support from the Volkswagen-Stiftung [5]; in 2004. The World Summit on the Information Society (WSIS 2003) developed the "Declaration of Principles: Building the Information Society: A Global Challenge in the New Millennium,"[6] and in February 2007, the First African Conference on Information Ethics was held in South Africa (First African Conference on Information Ethics) [7]. Building on the 2007 conference, in August 2008 a UNESCO and the South African government sponsored training workshop on IE and E-Government in Sub-Saharan Africa twill be held in South Africa.

Of course, many professional associations in the information field have had codes of ethics for years, and the Association for Library and Information Science Education (ALISE) recently established a taskforce to develop a code of ethics for ALISE, with a report due at its annual conference in January 2009. The topic of Information Ethics has been addressed in the literature, with an annual review of the literature on the topic first appearing in the *Annual Review of Information Science and Technology* in 1992 [8]. Over the past nearly 20 years, several iSchools have incorporated information ethics into their curricula, both as stand-alone courses and as part of other courses, many of which are required core courses.

2. IE EDUCATION AT PITT'S iSchool

In 1989 the School introduced a lecture series on "The Ethics of Information in Society" to help in shaping the Information Ethics course that was introduced the following year.
The course seeks to provide a background to applied ethics as a prelude to learning the skills of ethical decision-making and, then, to applying those skills to the real and current challenges of the Information Profession. The scope of the coursework and discussions includes decision-making and challenges related to information sources and services in all formats and media; to the Internet and other digital sources (cyber ethics); and to information-related topics in management. The objectives of the course, described as what students will be expected to have at the completion of the course, are:

> Developed a better understanding of themselves (in the ongoing endeavor to "Know thyself");
> Learned how to identify an issue, reflect on it (which is ethics) and make a decision that is moral;
> Engaged in reflective thinking and careful choice of words, which result in civil discourse;
> Developed an understanding of the art and science of applied ethics as related to the main challenges currently confronting the Information Profession.

The course is not a philosophy or religion course, but instead concentrates on the application of ethical reasoning to the Information Profession, with its many, diverse specializations. It is divided into three main sections: an introduction to applied ethics, the necessary steps for facing up to and resolving a moral dilemma and making a decision, and ethical issues in our field. The approach combines "knowing how" with "knowing why" and concentrates on the many questions to be asked in resolving complex issues, beginning with the individual. It is about each of us as an individual even though it is often easier to think of someone else's ethics, and also relates to interactions with other components of life (e.g., the environment, animals, etc.). The importance of the relationship between one individual and another and the need to learn to understand that each of us is a human worthy of respect – that we are fundamentally the same – is stressed. The initial assignment is for students to read and reflect on the *U.N. Universal Declaration of Human Rights* and Martin Luther King's "I Have a Dream" speech and to write a short paper on the Fundamental Moral Experience. They then identify a personal problem or issue (whether related to personal or professional life) and work throughout the course towards solution of the problem.

For the course, the definition of ethics used is:

> Ethics is the art and science that seeks to bring sensitivity

and method to the discernment of moral values. (Stephen Almagno and Toni Carbo)

Students read a series of books and articles, which change over time and are drawn from a number of disciplines, including philosophy, library and information science, business, and many others. The readings usually include at least two books, such as Stephen Carter's *Integrity* and the Dalai Lama's *Ethics for the New Millennium*, as well as articles from the *Journal of Information Ethics*, the *Harvard Business Review* and numerous other journals in the library and information field and from other disciplines.

3. MODELS FOR ETHICAL DECISION-MAKING

3.1 Context

Several readings and references to websites (including ICIE's website) have been included throughout the course to provide the context for ethical reflection and decision-making, in particular to emphasize the importance of different perspectives from cultural, social, and individual viewpoints. This broader understanding is essential to any course, especially this course. The course is taught in English to English-speaking students and is thus limited in the readings that are used, although students are encouraged to bring in examples from their own readings in different languages and from experience in their own countries and cultures. I have consistently emphasized my own limitations and encouraged others to broaden the views of everyone in the course.

One very helpful, if complex, source for understanding context is Clare Beghtol's work on ethical warrant [9]. Dr. Beghtol, who is on the faculty of the University of Toronto, Faculty of Information Studies, draws upon her extensive research to address problems of creating ethically based, globally accessible, and culturally acceptable knowledge representation and organization systems and foundation principles for the ethical treatment of different cultures. Basing her work on the *U.N. Universal Declaration of Human Rights*, she presents the concept of "cultural hospitality," to act as a theoretical framework for the ethical warrant of knowledge representation and organization systems. She concludes that the concept of cultural hospitality is promising for assessing the ethical foundations of systems for representing new knowledge and organizations systems and for revising existing

systems. Reminding us that each individual belongs to a number of different cultures at different levels (e.g., living in one country, speaking different languages, adhering to policies and practices of different religions and/or political parties, belonging to different social organizations, etc.), she notes that individuals may and do legitimately disagree. She also argues that the boundaries among cultures can themselves be fuzzy and create tensions within an individual. In her discussions of the relationships of any particular culture to its information needs and systems and noting differences among oral and written cultures, she raises questions concerning what kinds of information people need; what they do with it; the extent to which they value it; and whether they choose to perpetuate the information. Her thoughtful, if somewhat densely packed, paper raises several questions, such as whether principles of cultural hospitality can be used to develop culture-neutral systems and theories, which deserve much more discussion. Her paper continues to stimulate thinking and discussion by students.

3.2 Models and Frameworks

3.2. 1The Wheel

Over the fifteen years of teaching the course, we have used a series of models to assist students with ethical reflection and decision-making. Initially, Prof. Almagno used the model of a wheel with four groups of questions in the center hub: 1.) What; 2.) Why? How? Who? When? Where? 3) Foreseeable effects? And 4.) Viable alternatives. The spokes of the wheel are: Creative/imagination, reason/analysis, principles, affectivity, individual experience, group experience, authority, comedy, and tragedy. The questions in the hub provided questions for gathering information and to help in revealing other questions to be asked to determine reality. They also provide a reminder that ethical thinking requires dialogue, even if only with one's self. The spokes serve as evaluation resources through which moral consciousness and awareness can unfold, and they provide a systematic process to address the concerns about how to evaluate each step in making a decision. While some students found the wheel helpful in assisting their decision-making process, many found the steps suggested by the spokes to be somewhat confusing and to overlap.

3.2. Mason et al. Checklist

One example used is that proposed by Mason et al. in *Ethics of Information Management* [10]. They remind the readers that ethical dialogues are dynamic and nonlinear and suggest a "checklist" of six considerations to be taken into account when resolving an ethical issue [11]. These steps are:

1) What are the facts?
2) What ethical principles, standards, or norms should be applied?
3) Who should decide?
4) Who should benefit from the decision?
5) How should the decision be made?
6) What steps should be taken to prevent this issue from occurring again?

Step one relates to morally relevant considerations and requires both determining pertinent information (understanding the life cycles involved and identification of key decision-making processes) and identifying all the key stakeholders, their values, motivation, and physical history). This step establishes 'what is.' The second step concentrates on 'what ought to be," and identifies ethical considerations to be applied. The third step seeks to identify who should take necessary actions, how to ensure that all stakeholders are included, and legitimacy and right to make decisions, as well as the ability to affect a resolution. Step four addresses the various benefits of all the stakeholders and how to balance these, including both short-term and long-run considerations. Step five addresses the method of decision-making, which must be and perceived to be fair and ethical. The final step recognizes that each decision becomes a precedent and seeks to decide what procedures should be used in the future and what decision will be best for the future. Of course, this process must be used within the specific context of the stakeholders making the decision and within the wider societal context.

This framework has been somewhat useful in the course, but many students have found that it does not provide sufficient guidance for them. A key problem is that is starts with gathering facts **before** reflecting on the questions related to fully understanding what are the initial questions to be asked to help identify exactly what problems and issues need to be addressed. Also, little guidance is provided to address other questions, especially the second one.

3.3 Woodward Framework

The late Diana Woodward, formerly on the faculty of Drexel University, presents a framework for deciding issues in ethics [12]. She discusses advantages and disadvantages of consequentiality and deontology as bases for ethical reasoning in general, and intellectual freedom in general, concluding that a deontological defense of intellectual freedom is "safer" than one on consequential grounds. The article, while helpful for introducing some of the philosophical foundations and theoretical bases for ethical reasoning, does not provide a useful framework for addressing many practical, "real-world" issues.

3.4 O'Boyle

O'Boyle [13] concentrates on the use of the Code of Ethics from the Association for Computing Machinery (ACM), described as deontological because of its enumeration of rights (what is owed **by** others) and duties (what is owed **to** others), within a general ethical decision-making process to determine an action. Providing a sound discussion of earlier writings on the ACM Code, he places the Code within a general ethical decision-making process, he differentiates between to human faculties: intellect and will. O'Boyle builds on work of Rest and Kohlberg and identifies a six-stage process: 1) Moral perception and personal knowledge of the moral good (recognition that the problem exists); 2) Moral discernment and personal ability to think logically (stating the problem clearly); 3) Moral resolution and personal ability to think analytically (tackling the complexities of the problem to arrive at an individual position); 4) Moral assessment and personal ability to assess one's freedom (assessment, including being aware of the double-edged sword of new technologies); 5) Moral decision and personal knowledge of one's duties (decision, including personal duty and obligations); and 6) Moral action and personal willingness to follow one's intellect (free will used to take action). O'Boyle finds that the ACM Code is helpful with the first three stages, but not with the other three, and that training is needed to apply the Code effectively. He raises two provocative suggestions: that implementing the Code could be advanced by 1) making an individual ethical audit part of an employee's performance review, and by 2) hiring people who have some understanding and

training in ethical behavior. The students have found it helpful in applying codes of ethics to actual situations and problems, and they find the questions to be provocative. Because the article concentrates specifically on the ACM Code, the six-stage framework also has limitations. Also, it does not include extensive discussion of the various needs and perspectives of the various stakeholders, nor does it address many of the complex cultural issues.

3.4 Ottoson

One example from the corporate sector was Gerald Ottoson [14], a retired industry executive, who is now a consultant. Ottoson has conducted numerous ethics seminars over the years for workers in corporations. His approach is to spend a small amount of time on fundamental ethical values (e.g., honesty, mercy, justice, etc.) and to concentrate on models to examine real cases. "A Suggested Pattern of Inquiry," is presented as a checklist in reviewing and evaluating past actions. The model uses a series of questions: 1) Who should make the decision (includes where the legitimate power to make the decision lies, limits on authority, obligation/responsibility, need for knowledge—the essential facts, and neutrality/objectivity); 2) Who are the stakeholders (principle of regard for others); 3) What are the alternatives (including competing claims, costs/benefits, etc.); and 4) How should the decision be reached (inclusion in the process, perception of involvement, avoidance of paternalism). He notes that decision-making is always a compromise; there is no "perfect" solution; and that there will always be some regrettable aspects of the ultimate decision. He also realistically argues that the final decisions often leave the decision maker feeling a bit uncomfortable. While his framework is incomplete and open to many different interpretations, the students find this example, used in conjunction with others, to be helpful because of its emphasis on the workplace and its realistic questions.

Dr. Christine Altenburger, a retired faculty member from the University of Pittsburgh Graduate School of Public and International Affairs, taught applied ethics for many years. In her teaching, she developed a series of principles and a framework (unpublished), which she has given permission to use in our classes. The basic principles she identifies, summarized from those frequently found in the literature, are: 1) Do no harm. Do good if possible. 2) Observe the cannons of justice. Be fair. 3) Respect the rights, dignity, and freedom of all individuals. She also presents a flow diagram, beginning with gathering facts, leading to analysis and judgment, and incorporating decision loops to reconsider answers to questions.

These and numerous readings have been used throughout our course, but none provided the kind of framework or guide needed for our students as they worked towards resolutions of their problems. One very helpful resource I have used is *The Thinker's Guide to Understanding the Foundations of Ethical Reasoning Critical Thinking Concept and Tools* by Richard Paul and Linda Elder [15]. This brief *Guide* provides a concise discussion of the importance of critical thinking and the elements of thought, a checklist for reasoning, and a series of questions using these elements. It also summarizes problems of egocentric thinking and introduces a concise and straightforward introduction to the function of ethics, expanding on the discussion of egocentric thought, and addressing problems of "pseudo-ethics". It discusses the differences between ethics and: religion, social conventions, sexual taboos, political ideology, and the law. The authors also remind the readers of why it is important to distinguish among questions of ethics, social conventions, religion and law, and they present a series of elements of ethical reasoning. They propose an eight-step process to determine the logic of an ethical question: 1) purpose (considering an individual's rights and needs as well as those of others); 2) key ethical question(s); 3) information needed to answer the question(s); 4) concepts and principles to guide thinking; 5) main assumptions used; 6) points of view of all stakeholders; 7) main inferences/conclusions (what are the alternatives, are all being considered, etc.); and 8) implications (for self and others, including consequences, questions of harm/good, etc.).

This framework has worked successfully for students to address a wide range of questions and problems. I have also used it effectively as part of a brief introduction to Information Ethics is our required introductory course for Library and Information Science Students, "Understanding Information," in other classes, and in continuing education workshop. In the introductory course, students worked in groups of six to discuss the process they would use (walking through the eight steps) to respond to one of several hypothetical examples based on a real-world case. In each case, the students indicated that the framework encourages them to ask many questions and to examine different perspectives and issues. They also noted the usefulness of the framework in working

through individual problems. A significant flaw in the framework is that it focuses on logic and does not recognize the individual's emotions and subjective feelings. This leads to a discussion of the importance of recognizing that no human is ever totally objective and of learning one's own biases, personal values, and cultural perspectives. The *Guide* seems to be the best tool in our courses to help students work through ethical reflection towards making moral decisions, because it focuses on steps in critical thinking and encourages students to work through the steps, looping back to earlier steps, in the process. The steps rely on logic and objectivity and do not take into account the fact that no human is ever completely objective. This shortcoming can, of course, be addressed by the teacher through readings and by raising questions in the discussion. The guide also serves to help stimulate discussion among students and encourage raising questions about the many options to be considered throughout the steps.

4. PROPOSED UNDERGRADUATE COURSE

At this point, the undergraduate course is in the earliest planning stages. Several challenges must be addressed: 1) teaching undergraduates, rather than graduate students, 2) making the course both attractive and relevant for undergraduates, and 3) incorporating appropriate technologies. Although I have had the occasional undergraduate in my classes (usually from our BSIS program or the Honors College, with one student from the School of Engineering), I have not taught undergraduates. While I have done some research about differences in expectations, learning styles, and experiences in the Social Web, I must admit to some trepidation.
Recognizing that an increasing number of students in my introductory courses enter directly from college and knowing that students in this upper-level course will be predominantly college seniors reduces this concern to a great extent.

Building on the extensive use of case studies and online discussions and group interaction in my courses, I enrolled in a day-long workshop in case-based learning. This workshop was extremely helpful and helped me determine that this was the approach to use. I have decided to use cases based on three primary areas: 1) intellectual property protection and use (particularly downloading of music and videos); 2) freedom of expression (e.g., restrictions on hate speech at universities, content on Facebook, MySpace,

etc.); and 3) gaming. I am currently examining the growing literature on these three areas, especially existing case studies, to determine which readings and examples to include. I plan to use fiction and non-fiction, if possible, getting the assistance of an undergraduate to help identify pertinent literature.

Simulation models related specifically to Information Ethics are starting to appear in the research literature. At the ALISE 2008 conference, I learned of one being developed by Ken Fleischmann at the University of Maryland and his colleagues [16], and we have agreed that we will collaborate. He will make available the beta version when it becomes available from his research project, which will probably not be for at least two years , and I will provide ideas on content and presentation. In addition, as part of a proposal I am developing with colleagues in Information Science and Telecommunications, we will identify ways our two projects (if ours is funded) can share information and learn from each other's. Even if our proposal is not selected to go forward as the single proposal from the University, or if it is not funded, I plan to work with these colleagues to develop and incorporate simulations into the course.

This work is in the earliest stages, and I would appreciate comments and suggestions for the proposed course to help make it as good as it can be.

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Ethics, Information Technology and Today's Undergraduate Classroom

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ABSTRACT

This paper highlights interdisciplinary research grounding a course that is one of the core requirements of a new undergraduate informatics curriculum. *Ethics and Information Technology* explores the ethical dilemmas that exist where human beings, information objects, and information systems interact. The course tests the notion that the most effective way to explore how new technologies relate to integrity, truthfulness, trust, respect for privacy and individuality is to become immersed in a technological environment where unethical behavior as well as ethical norms can be safely and confidentially tested, evaluated, observed, and experienced. The paper will summarize an emerging literature in three areas: (1) the theories of ethics and information technology, (2) the characteristics of the "Net Generation" regarding the use of new technologies, and (3) the central role played by "trust" in assessing the ethical implications of new technologies, including online multiplayer games, image editing, collaborative authoring, and open source coding conventions. The paper will then demonstrate how this literature informs the design and implementation of the course.

Topics
Information policy, ethics and law

Keywords
Undergraduate education, Information ethics, Pedagogy

1. INTRODUCTION

A new course, *Ethics and Information Technology,* is a significant contribution by the University of Michigan's School of Information to a new undergraduate concentration in Informatics. The course is one of four required core courses for the newly approved major, which itself represents a deep collaboration among faculty across three University schools. The uniqueness of the undertaking raises the stakes, challenging the faculty of each school to define a rich field of study in ways that resonates intellectually across the entire partnership. The nature of this cross-campus collaboration influences the design of new courses, as well as the approaches to undergraduate education. *Ethics and Information Technology* tests the notion that the most effective way to explore how emerging technologies relate to information ethics is to immerse students in a technological environment where unethical behavior as well as ethical norms can be safely and confidentially tested, evaluated, observed, and experienced. In this regard, the course exists at the intersection of technology, ethics, and pedagogy. This paper frames the principal theoretical issues that underlie the design of the course and outlines its most salient pedagogical features.

2. CONTEXT

"Ethics" is variously defined [O.E.D.] as a branch of philosophy concerned with evaluating human action, the study of individual or group values, or a system of defining right and wrong behaviors. When applied to the professions, ethics defines a code of standards governing fair and responsible conduct with other members of a profession and the general public. In association with computer and information technologies, ethics concerns the relationship of systems with the people who use them. [14] Most recently, the concept of information ethics has extended philosophical consideration well beyond the human behavior to explore the ethical properties of information objects. [9]

The study of ethics within the context of information technology is international in scope. The International Center for Information Ethics (ICIE) identifies 104 individuals in over 90 organizations around the world whose primary field of scholarship and teaching is information ethics, with Germany, Japan, the United Kingdom, and the United States having a particularly strong presence in the field. [13] For the United States, ICIE's selective database lists 32 individuals in 30 universities with a primary focus on information ethics research. Nearly a dozen scholarly journals, continuing sequences of international conferences, and highly touted monographs and compendiums attest to the deepening scholarly interest in ethics and emerging technologies.

The teaching of ethics has traditionally been an important element of the university curriculum. The University of Michigan's Ethics in Public Life Initiative, for example, has compiled a current list of over 300 regularly-scheduled courses that involve ethics as a substantial component. [22] Academic disciplines offering these courses range from the traditional and obvious (e.g., philosophy) to the more subtle and nuanced (e.g., environmental studies). Every professional school at Michigan offers at least one course

at the graduate level focused on either professional ethics or ethics policies appropriate to the profession. Those professional schools that offer undergraduate courses or degrees include, but do not necessarily require the study of ethical issues to complete a major.

Ethics in the iSchools, however, presents a paradox. Ethics is simultaneously a core principle governing the formulation of their teaching missions and a minor or peripheral area of research. On the one hand, the websites for all of the 19 iSchools describe ethics as one of their important areas of concern. Nearly all iSchools offer specific graduate-level courses that include an investigation of either professional ethics or ethics policy issues. And yet, six of the 19 members of the consortium of iSchools account for a total of only eight faculty in the ICIE database of research specialists in information ethics. Although the ICIE database does not reflect the efforts of faculty who primarily or exclusively teach ethics, it is clear that research on ethics is not at this point in time a central research or teaching strength of most iSchools.

3. A FRAMEWORK

The undergraduate course *Ethics and Information Technology* exists at the intersection of three distinctive concepts: (1) the philosophy of ethics, (2) the social characteristics of emerging information technologies, and (3) the learning styles of a particular cohort of students. Although literature on the theoretical foundation for each of these areas is vast, there is a particular
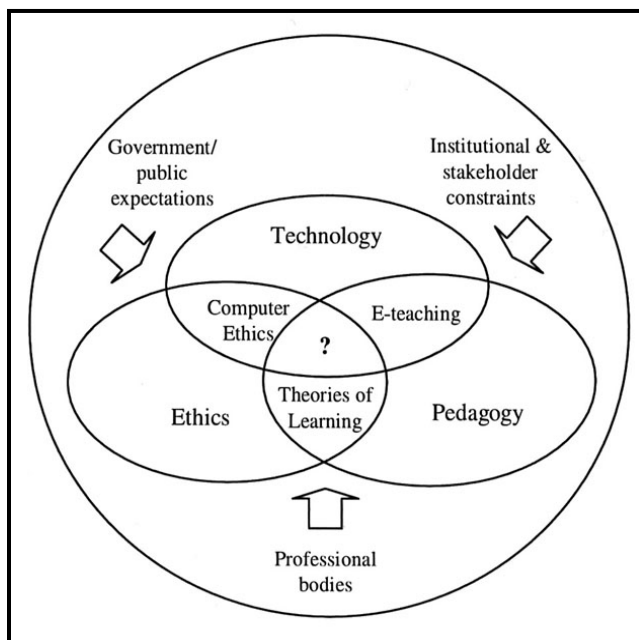

Figure 1. The links between technology, pedagogy and ethics

absence of literature that addresses the theoretical foundations challenges at the intersection. McRobb, Jefferies and Stahl [16] propose a framework that describes research findings in the areas where the concepts overlap and establishes a domain where the concepts of ethics, technology, and pedagogy are most dynamic. Figure 1 is the authors' graphic illustration of their framework.

The McRobb framework and its supporting literature is oriented toward the ethical issues involved in distance learning, drawing for support on the literature of computer supported collaborative learning. The conceptual model represented by the McRobb illustration, however, provides a convenient mechanism for highlighting how the issues that are at the heart of the Michigan course overlap and intersect. The framework includes three pressures that constrain the content of the three issue areas, among them the expectations of a wider audience regarding the evolving role of ethics education in the academy, the limitations imposed by university technology systems, and perspectives of various professional bodies or academic disciplines on the appropriate approaches to ethics education. Each of these constraining issues is at work in the design of a course that purports to exist outside the boundaries of the existing curriculum. Ethics and Information Technology is not only a new course but one that straddles and attempts to incorporate the perspectives of the three disciplines that are contributing to the new Informatics curriculum.

The framework is most relevant in identifying three distinctive intellectual spaces where conceptual overlap creates interesting new perspectives. First, the boundary where the study of ethics and the characteristics of emerging technology overlap, labeled in the figure as "Computer Ethics," provides a set of useful ethical models that are the intellectual structure of course. Second, the boundary where ethics and pedagogy overlap orients the course's interactive design and the flow of the individual course modules. Third, the boundary where technology and pedagogy overlap provides the rationale for an immersive technology environment in which students and instructor model the challenges posed by a suite of technologies.

4. ETHICS AND TECHNOLOGY

Scholarship on the relationships between information technology and ethical beliefs and behaviors have been debated and refined for the past fifty years. How this scholarship informs the teaching of these relationships is less well understood.

Terrell Bynum [1] credits the American philosopher/scientist Howard Weiner (the founder of the science of cybernetics) with foreseeing the enormous ethical and social impacts of information technology and laying the groundwork for the study of computer ethics. Writing in the 1950s, Wiener grounded his ethical theories of computer technology in the view that human beings are complex information feedback system that govern their relationships with other humans and the world around them. Drawing on Aristotle and flowing through Weiner's systems perspective, Bynum proposes that the purpose of human life is to flourish as a person [2] and to do so through a diversity of information processing activities. In this regard, the principal value of information technology is to extend human potential by reinforcing the principles of freedom, equality, and benevolence. Weiner simultaneously defined the ethical underpinnings of Vannevar Bush's Memex and anticipated the collaborative social technologies of Douglas Englebart. Bynum and others see the culmination of Wiener's vision of "flourishing ethics" in the theoretical constructs of Luciano Floridi's "Infosphere." [8]

James Moor is a bridge from the discipline of computer ethics to the broader world of information ethics. Moor [18] initially defined computer ethics in terms of a policy vacuum that occurs

when "new technological capabilities provide new choices for action in an environment where existing policies seem inadequate." Computer ethics includes consideration of both personal and social policies for the ethical use of computer technology. Writing twenty years later, following the explosion of the World Wide Web and the emergence of widespread social computing applications, Moor called for a more flexible and agile approach to investigating the relationship of new technologies to human ethical behavior.

Moor [19] establishes a three part progressive model of technology development that relates the maturity of revolutionary technology to increasing ethical complexity. According to his model more people will be involved, more technology will be used, and hence more policy vacuums and conceptual muddles will arise as the revolution advances." In the case of emergent (immature or experimental) technologies, such as the socially oriented tools and systems typified by the over-used moniker Web 2.0, Moor postulates his own "Law," which states that "as technological revolutions increase their social impact, ethical problems increase," because revolutionary technology provides many new opportunities for action "for which well thought out ethical policies will not have been developed." Moor lays out three approaches to study new technologies from an ethical perspective, including investigating new technologies before they have stabilized, using multi-disciplinary approaches to research, and adopting sophisticated ethical analyses to avoid the tendency to revert to simplistic cost/benefit analyses that translate ethical choices into monetary terms. "We need to learn about the technology as it is developing and to project and assess possible consequences of its various applications." The Michigan course places students into a policy-weak environment populated by technologies whose use and abuse are not fully understood.

An important open question at the intersection of ethics and technology is whether the social dynamics of new technologies are generating new ethical models of behavior. In addressing this question, Himma [11] focuses on the role of ethics in informed decision making. He reviews and ultimately dismisses claims that computer ethics has a claim to theoretical uniqueness. "Understanding computing technologies will help to produce well-informed ethical views – regardless of how we characterize those technologies."

Rafael Capurro [4] adds another dimension by highlighting the nature of the content that is embedded in or made accessible by networked technologies. He argues for a holistic view of information that is attentive to the mass transformation/transition of content from analog to digital. "In this broader sense information ethics deals with questions of digitalization, i.e., the reconstruction of all possible phenomena in the world as digital information and the problems caused by their exchange, combination and utilization." Capurro makes an essential connection between communication technologies and the human propensity to share and preserve. A basic moral principle of the information environment, he claims, "is to share knowledge, or the right to communicate in a digital environment which includes the right to preserve what we communicate for future generations." Capurro reminds us that the appropriation of modern information technology is not just a technical also but a culturally-bounded endeavor.

Luciano Floridi [9] presents, perhaps, the most well developed philosophical perspective on the ethical issues associated with information and communication technologies. Floridi's "Infosphere" encompasses not only cyberspace but also off-line and analog information spaces. Adopting an object-oriented approach to the design of a new ethical model, Floridi defines moral action as a "dynamic system" arising out of the interaction of seven principal components: 1) the agent, 2) the patient, 3) their interactions, 4) the agent's general frame of information, 5) the factual information concerning the situation that is at least partly available to the agent, 6) the general environment in which the agent and patient are located, and 7) the specific situation in which the interaction occurs. Drawing deeply on environmental physics, Floridi restates that the fundamental principles (or rules) of this dynamic system are grounded in the notion of information entropy – that is the destruction, pollution and depletion of information objects – ought not to be caused, ought to be prevented, ought to be removed, and ought to be protected, extended, improved, enriched and enhanced. [7] Information ecology as a parallel. Floridi's model and the norms it proposes structure the flow of the Michigan course.

The real question for the intersection of ethics and technology is the extent to which new technologies and the ways that people use them foster new rules of ethical behavior (perhaps culturally determined) or whether long standing principles are transferred to new technological contexts. The pedagogical focus of the course is designed in part to explore this issue dynamically and interactively.

5. NET GENERATION PEDAGOGY

A course that examines ethical issues associated with new technologies must necessarily take account of the learning styles and the general attitudes of the undergraduates who enroll. The conceptual design of the course, as well as its intellectual flow of the individual modules and use of technology tools in and outside the classroom are in part predicated on the notion that today's generation of undergraduates is somehow different than previous generations.

Allowing for fluidity in the boundary lines, a case can be made that at any point in time, generational cohorts bound by shared experiences and history exhibit behavioral and attitudinal cohesion. Commentators have labeled the generation of students born since 1981 (a somewhat arbitrary point in time) as the Net Generation, in part because they have grown up with the widespread availability of personal computers and the Internet. Strauss and Howe [21] characterize the members of the Net Generation as sheltered and protected but pressured to excel, endowed with a strong sense of their own specialness (indicated by high self-esteem), confident, and optimistic. They may be more team oriented than previous generations, more comfortable than average with multi-tasking, and very literate in the realm of digital and visual technologies. Gibbons [10] argues that the affinity of today's undergraduates for information technology "translates into new and different expectation about how to gather, work with, translate, and share information."

The apparent naturalness with which undergraduates embrace new technologies leads some commentators to see technological determinism at work. Lippincott [15] argues that "digital natives"

have acquired styles of learning and modes of interpersonal interaction as a direct result of the availability of network technologies, suggesting that the implications of this fact extend beyond the classroom to challenge and change the mission and purposes of libraries and other information services. Nye [20] and most scholars of the history of science and technology reject the deterministic thesis, arguing instead that "people become enmeshed in a web of technical choices made for them by their ancestors," helping to explain why people may seem trapped by the choices others have made.

The design of the Michigan course rejects a deterministic view of the technologies it utilizes but starts with the premise that there are generational differences in the perspectives of students and teachers. Such differences may be manifested genuinely in varying comfort levels with new and emerging technologies. But the course's structure, flow, and assessment methodologies leave open the question of whether Net Generation learners harbor a distinctive ethical world view in the use of these technologies.

6. THE CENTRALITY OF TRUST

The McRobb et al. framework (Figure 1) places a question mark at the center of its analytical framework where ethics, technology, and pedagogy meet. In their review of the associated research literature, the authors found that "there seems to be little interest in the exploration of the intersection of those areas…What appears to be lacking is a good overview of the relationships of the different issues involved." [16]

In adapting the McRobb framework, course designers used the concept of "trust" as an organizing principle for the individual modules. The O.E.D. defines trust as: "confidence in or reliance on some quality or attribute of a person or thing, or the truth of a statement." In placing trust at the intersection of ethics, information technology, and pedagogy, the Michigan course opens students to an examination of trust from multiple perspectives, for example trust in individual identity, trust of the integrity of digital content, trust in the transparency of open source code and the community of people who create it. As the case studies in Hutchings [12] demonstrate, the notion of trust also enters into the dynamic engagements between teacher and student, as well as student to student interactions inside and outside of class.

In terms of identity with the context of the course, Buchanan and Ess [3] demonstrate that trust bears on the extent to which behavior within a virtual environment is conditioned by knowledge of the identity of the agents within the environment. The creation, modification, and behaviors of avatars in an online environment is a particularly apt example of identity trust. Chesney [5] follows the same line of reasoning in examining the trust metrics underlying such collaborative writing efforts as Wikipedia.

In terms of content, trust is intimately related to the notion of "integrity," which Duranti [6] defines universally for textual documents in terms of reliability and authenticity. "It is generally accepted by all literate civilizations that documents are trustworthy (that is, *reliable*) because of their completeness and controlled procedure of creation, and which are guaranteed to be intact and what they purport to be (that is, *authentic*) by controlled procedures of transmission and preservation, can be presumed to be truthful (that is *genuine*) as to their content." Mitchell [17] reaches a less technical but no less measurable conclusion in reference to trust in visual content. "If an image follows the conventions of photography and seems internally coherent, if the visual evidence that it presents support the caption, and if we can confirm that this visual evidence is consistent with other things that we accept as knowledge within the framework of the relevant discourse, then we feel justified in the attitude that seeing is believing."

7. DESIGNING A COURSE

As conceived at Michigan, *Ethics and Information Technology* is one of four courses of a new undergraduate concentration in Informatics. The multidisciplinary concentration is a collaborative undertaking among faculty from the university's Computer Science & Engineering division within the College of Engineering, the Department of Statistics within the College of Literature, Science and the Arts (LSA), and the School of Information. The undergraduate concentration is based in LSA but draws on faculty from all three schools. Program development is led by a steering committee of two senior faculty from each of the participating schools. *Ethics and Information Technology* is guided by the collaborative spirit of the faculty development team, but is being designed and will be taught by a team of two faculty, one from the College of Engineering and one from the School of Information.

Ethics and Information Technology explores the ethical dilemmas that exist where human beings, information objects, and information systems interact. Modular in design, the course introduces students to a variety of ethical models from historical and cross-cultural perspectives and then explores the relevance of these models to a variety of new and emerging technologies that are inherently social in their construction and use. Initial examples of issues that the course covers in discrete modules include:

- interpersonal engagement through online games and virtual environments,
- the integrity of digital content in a networked world, and
- tradeoffs between security and openness of code, data, and information systems.

Students explore the technological underpinnings of associated technology systems, experiment with individual and group interaction with technologies, and examine the mechanics of ethical and unethical behaviors.

The course has two major instructional objectives: (1) integrate opportunities for direct hands-on technical experiences, in order to enhance understanding of ethical challenges presented by new information technologies, and (2) offer opportunities to participate via in-class discussions, short posts submitted to an online discussion board, and longer written assignments; in order to encourage multimodal contributions by students. Associated with the objective are three related learning outcomes: (1) demonstrate knowledge of current theories in information ethics; (2) apply ethics theories to interpret behavior when using a variety of information technology tools; and (3) evaluate the nature of ethical choices made by self and others when serving various roles.

New information technologies raise knotty issues regarding integrity, truthfulness, trust, respect for privacy and individuality, as well as the variations in ethical behavior across gender, racial and ethnic group, socioeconomic class, sexual orientation, and global cultures The course tests the notion that the most effective way to explore these issues is to become immersed in a technological environment where unethical behavior as well as ethical norms can be safely and confidentially tested, evaluated, observed, and experienced. The course will mix experiential learning with individual and group interaction with a variety of technologies.

This course is unique in its construction and in its mix of technological tools for instruction. Although a vibrant literature is emerging on approaches to teaching ethics and information technology and on the use of technology in the classroom, relatively little is known about learning processes and learning outcomes in the combination of ethics and emerging social technologies. The course will, in part, form a test environment for learning about how to use innovative technological tools to teach about the ethical dilemmas posed by these same technologies. Significant instruction takes place with the aid of technological tools available through an online virtual environment build on the Sakai platform that most University of Michigan students recognize as CTools.

7.1 Example: Module Assignments
Assignment 1: *Virtual Environments:* **Anonymity**

Students will create an avatar in a virtual world and adopt an anonymous persona. They will interact with their classmates in a secure environment over a period of several days, and then attempt to guess which student each avatar represents. Students will maintain awareness of such factors as whether they encountered any challenges in maintaining anonymity on a long-term basis; whether they employed confounding strategies to actively deter detection; how frustrated they were by others' anonymity; whether their anonymous status conferred a sense of freedom to behave transgressively; the extent to which their or others' personalities were identifiable through language, appearance, or gestures, etc. What are some of the unexpected disadvantages of anonymity in this environment? Apply ethical theories discussed in class in your analysis.

Assignment 2: *Virtual Environments:* **Cheating**

Students play videogames with colleagues: (1) cooperatively as a member of a team, and (2) competitively in an individual PvP exercise. (1) Students on each team first must discuss and decide as a group whether their team will collectively condone and engage in cheating behaviors in order to advance their progress, and note the results generated by their decision whether or not to cheat. Each team also must determine whether they have identified evidence of cheating by their opponents, and if so, what their response will be in return. (2) As individual players, students will be encouraged to cheat in one-on-one interactions in order to succeed. They must note their emotions, as well as their intellectual rationalizations, when engaging in transgressive behavior. Is the game more or less enjoyable when both players are known to be cheating? Apply ethical theories discussed in class in your analysis.

Assignment 3: *Information Integrity:* **Critical judgment**

In a three-part exercise, students examine a set of photographic images to which various enhancement algorithms and editorial techniques have been applied. Working in teams of two to four individuals, students will then categorize a set of existing digitized photo images according to a four part rendering scheme and evaluate the truthfulness of the images within the scheme. Finally, students will assess how meaningful and trustworthy are a set of images in an online exhibit by comparing and contrasting the messages of the image with the messages of the accompanying text.

Assignment 4: *Information Integrity:* **Collaborative editing roll playing**

Students will be assigned randomly to one of four roles: known author; anonymous author; known editor; anonymous editor. Students will play their roles in creating and editing content in a class-limited wiki. Topics chosen for creation and editing will be determined by the class. Students will be given explicit assignments regarding the submission of truthful and untruthful content and on the "rules of engagement" for adding, editing, and deleting content. Students will log their activities and seek to create together a set of trustworthy wiki entries. Discussion during and after the exercise will explore the challenges of establishing and keeping trust.

Assignment 5: *Secrecy and Openness:* **Cryptography**

The purpose of assignment is to assess the level of knowledge of the cryptography section of this course. An exam on the topic will be offered. The exam key will be posted on the CTools site *in advance* of the students taking the exam. However, the key will be posted in an encrypted form. The students will *not* be told which encryption scheme was used for encoding. Students will have the choice of studying for the exam in a traditional way, or putting their effort towards decrypting the answer key and guaranteeing full credit on the exam.

Assignment 6: *Secrecy and Openness:* **Role playing**

Homework is a role-playing assignment. Students are given a list of 'artifacts' of varying levels of importance to them personally, and to society in general. Students will then be asked (individually or in groups) to prioritize artifacts in terms of importance and need for secrecy. The initial evaluation will be from their current perspective as a UM student. Next, students will be randomly assigned a role for role-play. Students will again be asked to prioritize artifacts and reflect upon any changes in their prioritization scheme.

8. CONCLUSION
The design and implementation of an innovative course on ethics and information technology is a somewhat risky undertaking. First, we do not yet know of the market for the concentration and the extent to which the new course will both attract students to the concentration and fulfill critical learning objectives for the new Informatics Program. Second, we cannot anticipate the extent to which experiential teaching in the domain of ethics and information technology will lead to specific learning outcomes. Toward this end, the course instructors have partnered with the university's Center for Research on Learning and Teaching to develop assessment metrics new student feedback mechanisms. Third, we are not sure that the course will or should result in behavioral changes in the students who complete the course. We

believe the risk of failure (measured by either low enrollment or low student evaluations) is offset by the opportunity to create a learning environment that serves as a model laboratory for new research on teaching ethics at the undergraduate level.

9. ACKNOWLEDGMENTS

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Ethics and Social Justice in Undergraduate Informatics Education

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ABSTRACT

This paper examines social justice as a praxis oriented approach for infusing ethics and multiculturalism in undergraduate informatics education. Social Justice education includes an interdisciplinary study of information and communication technologies (ICT) that analyzes unequal power relations that exist in society, and a set of interactive, experiential pedagogical principles that help students understand the meaning of social difference in their personal lives, in their professional lives, and in their civic lives. The paper summarizes the theoretical basis of social justice and its relationship to ethics, multiculturalism and ICT. The paper also presents a pedagogical approach used in the design and implement of an existing undergraduate informatics course. Social justice education has the potential to prepare students who are (1) able to critically evaluate the intended and unintended consequences of ICT adoption and use, (2) sophisticated in their understanding of social institutions in shaping the meaning and intended uses of ICT, and (3) able to work with diverse others.

Topics
Information policy, ethics and law

Keywords
undergraduate education, ethics, social justice, pedagogy

1. INTRODUCTION

ICTs provide new and exciting ways for people to work, coordinate schedules, share information, maintain relationships and seek entertainment. In this paper, the information and the technologies that are employed by humans to create, organize, transfer and utilize that information in a networked environment are collectively known as "the information environment". This information environment is changing the ways in which we

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interact, communicate, and function on the job and in our daily lives. Emerging technologies also raise new economic, cultural, legal, ethical, and social issues that are of grave importance to society.

The College of Information Sciences and Technology (IST) at the Pennsylvania State University offers an existing course, *IST431: The Information Environment,* which surveys these diverse issues. This course examines how and why the evolving information environment influences the design, development and use of ICT. This course also examines the social impacts of ICT on people, organizations, and societies.

The information environment is a messy. The issues are not clearly identified, there are competing interests, and solutions are extremely difficult to develop because there is no one, best answer to the problem. To assist students in developing the skills necessary for coping with this situation, the course employs a social justice approach to education. The subject matter of the course is learned through a series of problems that enable students to learn about the layers of the information environment and the factors embedded in them. The learning format emphasizes a student-centered classroom activities and team-based projects that feature participation, inclusiveness, affirmation of human agency, social responsibility, and collaborative work in small groups. Through individual and group learning activities, students and the educator examine the influence of environmental factors on ICT and the impact of ICT on the environment. This paper summarizes the primary theoretical and pedagogical features of this course and the broader implications of social justice pedagogies for educators.

2. THEORETICAL FOUNDATIONS

According to Adams, Bell and Giffin [1], social justice education seeks the full and equal participation of all groups in a society. This is a vision of society in which diverse social groups mutually shaped ICT to meet their needs. In such a society, individuals are both self-determining (able to develop their full capabilities) and interdependent (capable of interacting democratically with others). Students should have both a sense of social responsibility as well as a sense of their own agency to speak and act in a manner that supports their beliefs.

Social justice education is also praxis oriented [2]. Praxis posits that theory and practice are interwoven, with practice being shaped by informal and formal, tacit and explicit theories. Hence, the way that we identify and articulate problems that exist in the information environment, the solutions that we entertain as viable,

and the methods that we choose as appropriate for realizing those solutions are all theoretical as well as practical questions [1].

Consequently, theory serves three important functions. First, theory enables us to reflect critically upon our intentions, decision-making, and the means we use to actualize our choices in the design of ICT. Computerized information systems, for instance, are generally designed for some idealized audience. Ethical problems surface when users with different knowledge requirements attempt to use the system. Hoesle [3] notes that computerized information system use requires people to act and think in prescribed ways that privilege Western cultural traditions while marginalizing the cultural traditions of others. Third-world cultures have unique forms of knowledge embodied in cultural artifacts such as mythologies, storytelling, proverbs, art and dance. While these forms of knowledge are legitimate and deserve to be preserved, Hoesle [3] posits that they cannot be equally well-represented through computerized ways of storing, representing and transmitting knowledge. In the 15 years since Hoesle authored this manuscript, ICT has advanced significantly. With Web 2.0 technologies, relatively low skilled users can author content in a variety of social media formats such as video, podcasts, wikis, and blogs. With these diverse formats, users now have more options for representing their unique worldview, and Hoesle's concern may be less salient. The challenge may be less a problem of inadequacies in computerized representations of knowledge, and more a problem of providing access to the tools and competencies that make self authoring possible. Open source applications provide lower cost technology solutions to organizations and individuals seeking alternatives to proprietary information systems. Both Web 2.0 and open source are based on community-oriented design intentions and choices, and expand the usage options for non-traditional users of ICT.

Second, theory has the potential to help us stay conscious of our position as historical subjects. Ethical implications arise from these historically situated power relations. For instance, ICT is often seen as an essential component of development and democratic practices. This viewpoint is expressed in the context of developing countries and historically underserved groups in the developed world. These groups are seen as excluded from the information society, and, consequently, should apply ICT or risk being left behind. This line of reasoning not only supports the technology imperative, but also subscribes to a development ideology that is based on a concept of history as linear and universal. All societies and people go through the same stages until they reach the same economic levels as countries and people considered developed [4]. The assumption is that ICT is neutral and nondiscriminatory in that it potentially provides equal opportunities to everyone; equal access to ICT ensures equal benefits. However, this ignores historical power relations such as colonialism, racism, and sexism to which ICT is inextricably linked. The perception that ICTs are necessary for development also ignores that technology invents its own needs such as software and hardware upgrades and training [5], as well as problems such as the environmental degradation that results from a Western lifestyle. Ecologically, it is impossible for the whole world to adopt a Western lifestyle [3]. Yet a Western lifestyle is offered as the standard for development.

Third, and perhaps most importantly, theory provides a framework for interrogating our practices and creating novel approaches to addressing issues in the information environment. Many of these issues, such as social and digital exclusion [6][7][8], privacy [9][10][11], and community and democracy [12][13], have strong ethical and multicultural implications. For instance, the digital divide is at least as much about cultural differences as it may be about disparities in income and infrastructure. Because the internet enables users to focus solely on receiving information from and communicating with like-minded individuals, Paterson [4] worries that the internet may foster fragmented existences that exacerbate existing social differences based on ethnicity, gender, geography, age and race.

The central implication underlying these issues of ethics and multiculturalism is how diverse people in different parts of the world experience the effects of the computerization. For some, the challenge is to continuously innovate and create new technologies, others grapple to keep up with the continuous changes enabled by ICT, and still others struggle to put in place the basic infrastructure that may allow them to participate in the global, knowledge-based society.

Praxis forces us to examine how power operates through normalizing discourses about ICT and power relations. Praxis reminds us to continually ask "in whose interest" prevailing systems operate [1]. The question of who is served by ICT provides a useful analytic tool for exposing hierarchical relationships, as well as the hidden advantages and penalties embedded in technologies that are purportedly neutral. A commitment to social justice requires an ethical attitude towards inclusion of diverse cultures and the potential of ICT to improve the capacity of human agents to transform their world.

3. COURSE DESIGN
The social justice approach evolved over five years of teaching and continuously improving *The Information Environment* course. The context in which the course is situated as well as the pedagogical mechanisms that were used in the evolution of the course are presented.

3.1 Context
The College of IST prepares undergraduate students to confront and manage the complex interactions among technology, people, and information. Students are broadly trained in the areas of software engineering and networking, user interface design, information systems development, human-computer interaction, and social informatics. Our curriculum integrates these areas through problem-based learning, often with industry-based collaborators. Students emerge from our program with a systems view of ICT, experience working in teams on unstructured problems, and an understanding of the contextual factors (from the technology itself to cognition, ethics, economics, and policy) that shape the design, adoption and use of ICT. In 2007, over 90% of our graduates were placed in technology-oriented career positions in diverse industries such as consulting, banking, manufacturing, healthcare and government.

Given the industry orientation of the IST curriculum and my professional experience and graduate education in information systems at an American business school, the initial design of the course focused primarily on professional ethics. Using the ACM and IEEE Codes of Professional Ethics as a basis, students were

grouped in teams and presented with fictitious scenarios that portrayed ethical dilemmas that they may face in their careers. The scenarios included breaches in the confidentiality of information, programmers' and analysts' obligation to act in a socially responsible manner, use of company computers for personal benefit, ownership of intellectual property, and electronic monitoring of workers. While the scenarios generated good discussion, students didn't seem to internalize the material.

A second approach was to replace the fictitious scenarios with real-world cases from the popular press. Student teams were asked to evaluate and debate the behaviors of the various stakeholders presented in the cases. Again, most students failed to personalize the ethical issues

To obtain insights as to how I could improve the course, I instituted a student quality team. In our college, student quality teams assess the classroom learning environment and provide educators with feedback to help them improve course design. The student quality team program is student-organized and managed. Team leaders are trained in quality principles, team management, survey design, and diplomacy. They also receive nominal salaries. Team members are recruited from students enrolled in the course, and they receive one credit of independent study for their effort. Students noted that the scenarios seemed abstract and removed from their daily lived experiences. They had little formal experience working in a business organization. Consequently, they had yet to develop a strong professional identity. Also, because ethics was isolated in a course module and presented solely as a professional concern, the importance of ethical considerations was minimized.

While considering the student feedback, I attended the Multicultural Teaching Academy at the Schreyer Institute for Teaching Excellence at the Pennsylvania State University. Social justice was presented as an approach for infusing multiculturalism and ethics in undergraduate education. Social justice also fit with my research interests in ICT and social exclusion, and personal commitment to improving the recruitment, retention and academic excellence for women, students of color and international students who are severely under-represented in our program. Hence, social justice formed the basis for the third iteration.

3.2 Pedagogical Approach

A pedagogy respectful of social justice and human diversity begins with the educator's sense of social responsibility [14]. Education is fundamentally ethical and political in nature. Ethics and politics are inherent in the teacher-student relationship, in the physical conditions of the classroom, in the grading, and in the readings and course content that are chosen or excluded from the syllabus.

To achieve a democratic learning environment that is inclusive and meaningful to students, the first day of class begins with the educator presenting an overview of the course and the key learning objectives. These learning objectives include:

- identify major themes in information policy studies (e.g. ethics, privacy, workplace monitoring, security) and relate these themes to the applications of ICTs

- use conceptual frameworks to frame analysis of ICTs in their context of use, at varying levels of analysis (e.g. individual,

organizational, societal, global) reflected in the information environment

- analyze the impacts of information systems and technology, and make appropriate policy recommendations

Students are then broken into teams and asked to identity three important topics that they would like to explore. The class then organizes the topics into themes that are then incorporated into the syllabus. Table 1 provides an example of topics that were explored during the Spring 2007 semester.

Modules	Sample Topics
Theories of technology and social change	technology determinism, social determinism, social informatics
Technology and consumerism	sign value, use value, media consolidation, consumption, technology fetish, identity, data warehousing, personalization
Technology and the body	reproductive technologies, genetic testing, cloning
Technology and communities	social media, digital divide, online gaming communities, community wi-fi
Technology and deviant social behavior	cyberstalking, identity theft, sexual predators, virtual rape
Technology and work	electronic monitoring, global workforce, deskilling / upskilling

Table 1: Learning Module

In addition to inclusiveness, the educator seeks to leverage the cultural diversity that exists in the classroom. Being socialized and living in the dominant culture often lessens our awareness that our beliefs and behaviors reflect a particular racial, ethnic, or gender affiliation. According to Wlodkowski and Ginsberg [15], white males have a more difficult time acknowledging the idea that Anglo-Americans and Western norms enjoy a privileged position in the United States' educational system. Culture is taught and understood implicitly, which is why it is difficult to explicitly describe who we are culturally. Consequently, we are more likely to experience uniqueness of our own culture when we are in the presence of those who are different from ourselves. Since, on average, 85% of the students enrolled in the course are white males, the challenge is to exploit the cultural diversity that exists within this group.

For example, students vary in their political affiliation. The social media learning activity exploits this difference by asking students to compare and contrast the use of You Tube, Facebook and other social media applications by 2008 presidential candidates. To help students understand how gender mediates social interactions, male students create female avatars and interact with others in a virtual world. They then report on their experiences. In the assignment on digital divide and internet indispensability, students keep journals on their internet use for a 24 hour period. They then reflect on the benefits of their use as well as the losses they may have suffered if they lacked internet access. After they complete this assignment, I ask students to collect statistics about ICT diffusion and other e-Readiness indicators for a developing country of their choice and compare these to comparable indicators for the US. Students are often astounded by the disparities that they uncover, and in some cases express a deeper appreciation for the privileges that they derive from internet

access. A few students are highly motivated by this exercise and extend this work for their semester long research project. These students conduct an experiment in which they give up their cell phones on for a weekend and reflect on this experience as a means of experiencing life as a "have not". Students consistently note extreme difficulty in coordinating schedules with friends, missing important phone calls from employers, the loss of social status that comes from cell phone ownership, and the loss of social connectedness that results from the inability to communicate with friends anytime / anywhere. One student recounted how he often provides technical support to his friends. During the weekend when he turned off his mobile phone, he missing a late night call from a frantic friend who experienced a computer problem while writing up a term paper that was due the following morning. As a result, the student was faced with the tough task of repairing his relationship with his friend.

There are a number of procedures used for classwork and assignments. Peer teaching is used in nearly every class. Students sign up to deliver individual presentations that correspond to the topics that will be discussed during the semester. In these presentations, students find current news articles, interesting websites, YouTube videos or other media related to the topic that they chose. Each presentation ends with a class discussion in response to two probing questions developed by the presenter. Through this exercise, each student acts as a teacher for the group. Additional procedures include group writing using wikis, journaling using blogs, small research projects such as examining privacy and identity using Facebook profiles, deconstructing advertisements for technology-related products, and using discussion forums to generate insights about characteristics of members of online gaming communities. Team-based research projects are the main way for students to demonstrate in-depth learning experience with humans and ICTs. Through these procedures, students are engaged in critical questioning, problem posing, and research that enable them to utilize their strengths, experiences, and values to deepen understanding of social, political, cultural and ethical issues that exist in the information environment.

4. IMPLICATIONS FOR EDUCATORS

The social justice approach has several implications for educators. First, educators have to address two sources of power asymmetry in the classroom – (1) the educator's institutional power, status and authority, and (2) the educator's social status characteristics such as race, gender, age and nationality. As an African-American woman teaching undergraduate courses to a predominantly white male student population, there are clearly many ways in which the educator and students are not alike. The challenge is to foster a classroom environment in which the educator's authority and expertise is clarified and made explicit because it bears on grading, evaluation, and classroom norms. Omolade [16] argues that "authority with, not authority over" is complicated by social status differences between the students and the educator. Female educators of color must maintain democratic structures to foster authority with students. Once this mutual respect is established, students will accept greater responsibility for establishing an active and engaged learning environment.

Second, the instructor must create a safe environment that encourages discussion. Silence in the classroom can result from a number of factors including fear of being patronized, anger,

anxiety, hostility, ignorance, or resistance to being forced to speak. For hooks [17] silence is not always about the failure to make an utterance. Sometimes, silence is the fear of being unable to make a speech that compels others to listen. Silence can be the fear of not being heard. Educators can use their classroom authority to create a safe classroom environment that compels students to value their own voice by establishing classroom norms to ensure respect and the amicable resolution of conflicts. Technologies such as message boards where students can post comments and pointers to relevant information provide another means by which students can participate in the course.

Finally, educators must enable students to understand that the power relations that exist in society are not the natural order of things. The privileges that we enjoy in life are the result of historically constructed forces which can be changed. As future information technology professionals, students can use the political influence, resources and human agency to create and implement ICTs that are socially just, environmentally benign, and enable positive social change.

5. CONCLUSION

Social justice provides a useful approach for infusing ethics and multiculturalism in undergraduate informatics education. A social justice pedagogy for the study of ICT and its social implications would necessarily include teaching that pays attention to personal safety and classroom norms, begins from students' worldview, and uses students experiences as a basis for course content and problem-posing. This student-centered approach is vastly different than the traditional lecture-discussion-testing mode of higher education that has existed for centuries, and requires a shift in the power relations between students and educators. Educators seeking to adopt a social justice approach may do so in incremental steps by experimenting with different assignments and classroom activities, and by fostering a classroom atmosphere that invites everyone to speak from their own voice of experience, take risks, and learn from their mistakes. Social justice education has the potential to prepare students who are (1) able to critically evaluate the intended and unintended consequences of ICT adoption and use, (2) sophisticated in their understanding of social institutions in shaping the meaning and intended uses of ICT, and (3) able to work with diverse others.

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