

Computer Ethics: A Slow Fade from Black and White to Shades of Gray

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Abstract

The expanded use of teaching case based analysis based on current events and news stories relating to computer ethics improves student engagement, encourages creativity and fosters an active learning environment. Professional ethics standards, accreditation standards for computer curriculum, ethics theories, resources for ethics on the internet, and possible topics for ethical case analyses are presented. The motivation for teaching Cyber Ethics and a number of success strategies and recommendations for undergraduate Computer Ethics courses are provided.

Keywords: ABET Accreditation Standards, Computing Curricula 2001(CC2001), Professional Code of Ethics, Computer Ethics, Cyber Ethics, Computer Science, Information Technology, Computer Information Systems, Pedagogy, Computers and Society.

1. INTRODUCTION

The Accreditation Board for Engineering and Technology (ABET) has nine common outcomes which apply to Computer Science (CS), Computer Information Systems (CIS) and Information Technology Programs (IT). Computer Ethics is one of these nine outcomes and graduating students must have an understanding of professional, ethical, legal, social issues and responsibilities (Homkes & Strikwerda, 2009).

In addition to satisfying the accreditation standard, an undergraduate CS or CIS course must engage the students and encourage analytical thinking, creative writing and research. Students in the Engineering and Technology fields are problem solvers who typically look for a single solution (i.e. the code

is working or the answer to an equation). Thus, the teaching of Ethics must broaden the student's perspectives and understanding of certain real world scenarios, which have no absolute correct answer but rather multiple viewpoints and opinions. For example a current event topic such as the Chinese Censorship of Microsoft and Google, has the Chinese Government attempting to police and control information provided to the general public, which is contradictory to the freedom of the press and free speech values of American Society (Chao, 2010).

This paper describes the course format for an Undergraduate CS/CIS course taught at the University of Michigan Flint. The paper presents the basic goals and objectives of the course, the motivation for teaching such a course, the relevant codes of ethics, ethic

theories, overview of topics covered, grading rubrics and additional resources for teaching Computer Ethics. A number of success strategies and recommendations for teaching undergraduate Computer Ethics are also provided.

2. COURSE GOALS AND OBJECTIVES

This course introduces students to the ethical issues and controversies that comprise the new field of Cyber-Ethics. The field of Cyber-Ethics refers to the broad spectrum of computing and information technology ranging from hand held devices, stand-alone computers, privately owned computer networks and the public internet. Issues addressed examined the moral responsibility of computer professionals in the broader context of social and ethical applications of information systems and computer technology.

In this course, students were discussing ethical challenges and ethical controversies using actual case examples and contentious scenarios to illustrate the various ethical dilemmas and various stakeholder viewpoints. In contrast to traditional science and engineering, ethical issues and cases do not have clear-cut straightforward solutions. Hence, it is important to look for strategies, stakeholder interests and different viewpoints of each stakeholder for analyzing these issues. Students must learn to examine topics from a variety of perspectives that sometimes conflict with each other (Dark, et al., 2008). The course was designed to encourage student creativity, student engagement, research and writing skills.

Motivation for Teaching Ethics

The ABET accreditation requirements state that the program of study “enables the student to achieve, by the time of graduation:

- An understanding of professional, ethical, legal, security and social issues and responsibilities.
- An ability to analyze the local and global impact of computing on individuals, organizations and society” (Homkes & Strikwerda, 2009).

The IEEE-CS/ACM Joint Task Force on Computing Curricula recently mandated the inclusion of sixteen core hours of instruction on topics that are *social*, *ethical*, and *professional* in the curriculum for undergraduate computer science students. These topics, each prefaced with an *SP* designation, define one “knowledge

area” or a “CS body of knowledge.” They are distributed among the following 10 units:

- SP1: History of computing
- SP2: Social context of computing
- SP3: Methods and tools of analysis
- SP4: Professional and ethical responsibilities
- SP5: Risks and liabilities of safety-critical systems
- SP6: Intellectual property
- SP7: Privacy and civil liberties
- SP8: Computer crime
- SP9: Economic issues in computing
- SP10: Philosophical frameworks of ethics (Tavani, 2002)

Of particular interest to ethics instruction *per se* are the methods and tools of analysis (SP3) which provides students with instruction on how to make and evaluate ethical arguments, and then identify and evaluate ethical choices (Tavari, 2002). Among the topics recommended for inclusion in SP 10 are instructions on philosophical frameworks that include deontological and utilitarian theories.

Currently there is a joint committee called Computing Curricula 2001 (CC2001) involving the Association for Computing Machinery and the IEEE Computer Society, which is producing curriculum guidance for the broad area of computing. The purpose of CC2001 is to evaluate future developments in computer engineering in the next ten years (2013) and beyond. The CC2001 Task Force was asked to develop a set of curricular guidelines that would match the latest developments of computing technologies and endure through the next decade. Principle 10 from the CC2001 Task Force states:

“The computer engineering curriculum must include professional practice as an integral component of the undergraduate curriculum. These practices encompass a wide range of activities, including management, ethics and values, written and oral communication, working as part of a team, and remaining current in a rapidly changing discipline” (McGettrick, et al., 2003, p. 9).

In addition to the requirements of the ABET accreditation standards and those of the IEEE-CS/ACM, an understanding of ethics is particularly important to Computer and IT students due to the ubiquitous nature of computers, information technology, web systems and internet applications in our daily

lives. Computer applications and information systems are used by people to drive cars, control life preserving and life taking devices, and affect many daily functions from banking, shopping, entertainment, education, etc. Computer and Information Systems are a critical component of our society and citizens and customers do not and cannot be expected to understand the systems on which they depend for vital life functions (Johnson, 2007).

Computer professionals must act in a socially responsible and ethical manner to be worthy of the public trust. The special talent and knowledge required for developing and managing these IT systems leads to a social responsibility to use it for the good of society (Reddy, 2004). Students need to think about the consequences of their professional decisions, evaluate their actions in terms of their social responsibility and the long-range ethical impact.

Relevant Codes of Ethics

The ACM code of ethics and the IEEE code of ethics are presented in the course to expose students to the broad social consciousness of "Cause No Harm" and in cases where there is low quality work or potential for dangerous outcomes, it is your responsibility to act positively to rectify the situation (Reddy, 2004). The original ACM code of Ethics and Professional Conduct stated, "An ACM member shall consider the health, privacy and general welfare of the public in the performance of the members work. An ACM member, when dealing with data concerning individuals, shall always consider the issue of individual privacy and seek the following: to minimize the data collection; to limit authorized access to data; To provide proper security for the data; to determine the required retention period of the data; to ensure proper disposal of the data" (Landau, 2008).

The current ACM code of ethics is presented and compared to the code of ethics from two different IT professional societies as shown in Appendix I.

The institute for Certification of IT Professionals (ICCP) uses a code of ethics to emphasize high standards of skill and knowledge, the maintenance of confidentiality, and that the IT professional will recognize the public reliance upon the standards of conduct and established practices. The Association of Information Technology Professionals (AITP) has a code of ethics that encourages members to:

- Promote management's understanding of information processing,
- Act with honesty and respect,
- Participate to the best of their abilities in the distribution of IT knowledge,
- Protect confidential knowledge,
- Uphold the ethical and moral principles of educational institutions,
- Practice trust to their employers to guard the employer's interests and
- Respect their countries and the chosen way of life of those countries (Brinkman, 09).

The seven values or key concepts comprising any code of ethics are consistency, respect for individuals, autonomy for all, integrity, justice, utility and competence (Panye & Landry, 2006).

Challenges

This is a major thought process shift from the traditional software development methodology of merely writing code and solving problems (Reedy, 2004). It is challenging to have undergraduate students understand the importance of ethics and professional responsibility. Hence, the notion of what is professionally acceptable and good in computing and information systems is best illustrated by examples and case studies. The use of major catastrophes such as the European Agency Ariane 5 rocket, which crashed on June 4, 1996, 37 seconds after liftoff and cost about \$500 million provides an attention grabber that undergraduate students can understand. The software flaw was a simple computational error of converting a 64-bit integer into a 16 bit unsigned integer, without any exceptional handlers for errors (Jézéquel, Meyer, 1997).

3. PEDAGOGY

The Course CIS/CSC 150 is a one credit course, taught at the undergraduate level over a period of twelve weeks with class periods held alternating weeks for a total of six class periods. The first two class periods provide lecture material and discussion material from the textbook, to provide ethical theories, definition of terms such as ethics, morality, rules of conduct, moral system, critical thinking skills and the basic structure and strength of logical arguments. The other class periods are devoted to student's discussion of their case study

assignments, current events and news stories relating to computer ethics.

Top Down Teaching Approach

The division of the course by including both the theoretical foundation from the textbook and the use of case studies is beneficial since it includes both the top down and the bottom up approaches for teaching computer ethics. The top down approach to ethical thinking evaluates a social and/or moral problem by applying the universal principle based upon several important ethical theories. These ethical theories are covered in popular textbooks of Basse, Johnson, Quinn, Spinello and Travani and present theories including Kantianism, utilitarianism, rights based theories, social contract theory and virtue ethics (Quinn, 2006).

The text *Ethics and Technology Ethical Issues in an Age of Information and Communication Technology* by Travani was utilized by this course to present the different ethical theories and critical thinking skills. Cyber ethics is a branch of applied ethics examining practical ethical issues and performing analysis of specific moral problems by the application of ethical theories. Ethical theories such as utilitarianism, which provides the greatest good for the greatest number of people are presented. Other ethical theories covered in class include:

- Character Based Ethical theory or Virtue ethics focuses on decision criteria based upon the character development of individuals and their acquisition of good character traits and habits (Tavani, 2007).
- Kantian analysis requires that the actor treat everyone the same and it requires that the actor would find such treatment acceptable if visited upon himself. The action to be undertaken must respect individuals as valuable, and the person acted upon is due respect. The autonomy of all persons and their freedom to make voluntary and informed choices must be recognized. Kantian ethics can be reduced to something approximating the well known "Golden Rule" (Panye & Landry, 2005).
- Duty Based or Deontological theories, which argue that morality must be ultimately grounded in the concept of duty or obligations that humans have to one another (Tavani, 2007).
- Utilitarianism theory, which is based on the principle of social utility or social use-

fulness measured by the amount of happiness produced (Tavani, 2007).

- Contract-Based theories where individuals surrender some of their absolute freedom in return for a system of laws and regulations, which are designed to protect individuals from being harmed by other members of society (Tavani, 2007).

Critical thinking skills and criteria for determining and differentiating among arguments that are sound vs. unsound, valid vs. invalid, and inductive vs. fallacious, and a strategy for evaluating the overall strength of reasoning were also covered.

Bottom Up Teaching Approach

The second approach used for teaching this class is the bottom up methodology utilizing a case study approach, based upon the student's research and written assignment. Each student was instructed to select two cases from the textbook and two cases from the own research sources. The last four class periods were devoted to student discussion of their four written assignments.

Unfortunately, textbook topics for ethics classes typically deal with topics that Information Technology (IT) and Computer Information Systems (CIS) students will not personally experience and cannot relate to such as bribing a purchasing agent, insider trading, or illegal corporate activities. To engage students in ethical discussions, case studies and topics which students deal with on a daily basis and have personal experience with are more interesting and relevant (Sherman, 2007).

All students were presented with the following assignment requirements at the first class meeting. Students read the Wall Street Journal, Business Week, Information Week and other references cited in the Textbook or IT trade journal publications and prepared a research report. The research report was on current Cyber ethics issues such as privacy, security, electronic monitoring of employees, collection and use of personal information on consumers, identity theft or other ethical topics related to course material.

Grading Rubrics

The grading rubric for the assignment was based upon the author's research and was adopted from the In-Depth Case Analysis Rubric Media file EE_FinalRubric_S06.doc, found on the web site: *Rubrics for Exams and Group Projects*

in *Ethics*, located at the web site <http://cnx.org/content/m14059/latest/>. This original grading rubric provides an assessment for a final case analysis report that is based on the Social Impact Statement Analysis described by Chuck Huff at www.computingcases.org.

The actual grading rubric utilized in this course is a simplified version of the In-Depth Case Analysis. The grading rubric encouraged students to identify the ethically relevant facts and provide a summary of ethical issues in the case. Stakeholder's opinions, their different viewpoints and potential conflicts were to be identified by students, who also had to justify their claims using ethical arguments. The report was also evaluated for how well the student correctly applied problem categories (disagreement, & conflict) to classify the ethical components and uncovered the ethical issues that are embedded in complex, concrete situations. The last criteria of the grading rubric assessed the writing style, format, grammar and references of the report. The grading rubric is shown in Appendix II.

4. ETHICS WEB RESOURCES

There are many academic resources and web site resources available on the topic of computer ethics. The U.S. National Academy of Engineering (NAE) has a Center for Engineering, Ethics and Society (CEES, <http://www.nae.edu/ethicscenter>) which was launched in 2007. The CEES also manages the Online Ethics Center (OEC) at the NAE (<http://www.onlineethics.org>) to provide students and professionals in engineering and science the required resources for understanding and addressing ethical problems that arise in their work and to promote learning and advancements in the understanding of responsible research and practice (Hollander, 2010).

The <http://www.onlineethics.org> site is made possible by a generous grant from the National Science Foundation in response to the American COMPETES Act to improve resources for ethics in science and engineering education. The CEES at the National Academy of Engineering and the Ethics Education Library (EEL) at the Center for the Study of Ethics in the Professions at the Illinois Institute of Technology are working together on this project.

Charles Huff, Department of Psychology, St. Olaf College has a long standing research

interest in identifying and evaluating ethical professional behavior. His seminars and related topics can be accessed from <https://www.stolaf.edu/people/huff/links/links.html> Additional relevant web sites for ethics and related information can be found in Appendix III.

An interesting approach for navigating across the different cyber ethic topics is provided by Dr Edward F. Gehringer who has posted a geographical site map with active hyperlinks to various cyber ethics topics and related issues on the site <http://ethics.csc.ncsu.edu/> The Ethics in Computing Site Map is shown in Figure 1.

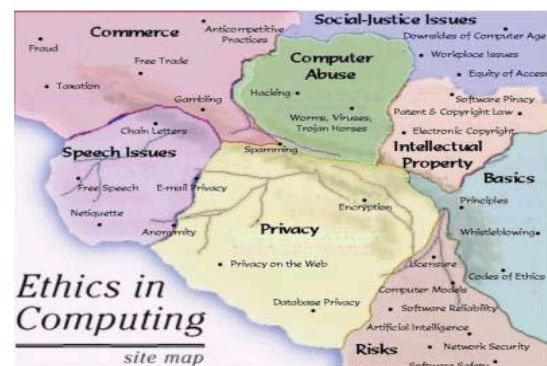


Figure 1 – Ethics in Computing Site Map

5. RESEARCH SOURCES

Students were initially provided with the following potential list of topics for their research:

- Types of Crime aimed at IT Systems: Viruses, Spyware, Phishing, etc.,
- Security Measures: How good they are, what they cost, how do they protect computers, how expensive are they to implement?
- Electronic monitoring of employees.
- Collection and use of personal information on customers/consumers (i.e. Wal-Mart)
- Identity Theft.
- Wireless Networking Hacking and Vulnerability, including detection and prevention measures.
- Unethical uses of email, and internet usage, such as spam, chain letters.
- Computer viruses include detection and prevention measures.
- Privacy Laws - Homeland Security, Freedom of Information Act, Family Education Rights and Privacy Act, HIPPA, etc. List the pros and cons arguments on the legislation, does

it protect national security vs. invade personal privacy?

- European Directive on Protection of Personal Privacy.
- Breach of Information - TJ MAX, Bank of America, Lexis Nexus, DSW Shoe Store
- Cyber Bulling/Cyber Stalking, research the case of Megan Meiers.

Reference articles were also posted on Blackboard™ as shown in Appendix II. These topics and articles were used to “jump-start” class discussions, and provided real world, current events for Cyber Ethics. Class discussions of these reference articles fostered the idea of critical thinking and identification of multiple viewpoints by dividing the class into separate groups and allowing each group to voice their viewpoint and then understand and respond to the viewpoints of the opposing stakeholders.

Student Motivation with Music

The initial approach to getting students engaged and participating in a discussion of ethical issues that student have experienced was to start by playing the song “It is a slow fade” by Casting Crowns. The music lyrics are (Casting Crowns, 2010):

“It's a slow fade when you give yourself away
It's a slow fade when black and white have
turned to gray
Thoughts invade, choices are made, a price will
be paid
When you give yourself away
People never crumble in a day

The journey from your mind to your hands
Is shorter than you're thinking
Be careful if you think you stand
You just might be sinking”

The song was used to stress the point that ethical dilemmas are not just black and white but have shades of gray since there can be a dichotomy of decisions all of which have rational judgments. Students were asked to provide examples from the personal experiences of ethical challenges. One student shared his experiences working for the Department of Defense. There was a new security policy implemented which prevented employees from accessing the public internet. This was done to minimize the lost productivity and time spent by employees on non-government related work. Unfortunately, once the new security policy was

implemented, the purchasing agents could no longer perform their job function of searching for the lowest cost supplier and accessing the supplier web sites.

Identity Theft Role Playing

The case of the T. J. Max Credit Card Breach was utilized to foster student engagement and encourage the development of different stakeholder viewpoints. The Article was presented to the class stating that in 2005 TJX reported at least 45.7 million cards were exposed, while banks' court filings put the number at more than 100 million, but there has been no estimate of the total fraud. In 2007 TJX was the subject of a class-action law suit seeking “tens of millions of dollars” by The Massachusetts Bankers Association, which represents 207 financial institutions (Gaudin, 2007), (Shain, 2007).

Students were divided into different groups and then asked to voice their viewpoints as the consumer, the CIO and IT department managers of T. J. Max, or the Bank Association that is suffering financially from the stolen credit card losses. The consumer group voiced outrage over the negligence of T. J. Max to allow the security breach to go undetected and having it continue for such a long period of 18 months. The T. J. Max CIO and IT department managers stated that they had followed all the correct government rules and regulations and had standard security practices in place, hence they were not liable and should not have to settle the class action suit. The Bank Association was insistent that financial compensation be awarded in the class action suit to compensate for their financial losses.

The T. J. Max role playing scenario had reasonable arguments on all three sides, the consumers, the company, and the banking association. There was no “unarguably right answer”. Students on each side needed to be able to explain why their side was “correct” and how to disagree with the other stakeholders (Brinkman, 2009). The role-playing of different stakeholders allows the students to actually experience the issues from a real world perspective rather than passively receiving it (Pollard & Duvall, 2006).

6. OVERVIEW OF TOPICS COVERED

The submitted student’s reports covered a very diverse number of computer ethics topics and

were very original and innovative in some of the topics selected. Some of the major topics are:

- Identity Theft
- Internet Crimes and Computer Security
- Cyber Bullying/ Cyber Stalking
- Wireless Hacking
- Internet Bandwidth Throttling
- RFID Tags
- Employee Monitoring
- Search Engine Privacy
- Chinese Government Censorship of Google/Microsoft
- Customer Relationship Management
- Homeland Security/Airport Security
- Internet Music & Intellectual Property
- HIPPA Records Electronic Medical Records
- Software Piracy
- Privacy Rights in Web Based Advertising

Detailed ethical issues regarding these topics can be found in Appendix V.

7 INTERESTING, AND CONTROVERSIAL CASES

Cyber Bullying

Cyber bullying is increasingly prevalent in modern youth, and a recent survey has shown that 43% of teens in the United States experienced a form of Cyber bullying in 2008. In contrast, Canadian middle school children reported that 23% have been bullied by email, 35% in chat rooms and 41% through text messaging (Wagner, 2008).

One of the most recent and well-publicized cases of Cyber bullying is that of Megan Meier, a 13 year old girl from Missouri. An older neighbor, Lori Drew, impersonated a teen-age boy on the social networking site MySpace. Assuming the persona of a teen-age boy friend Mrs. Drew wooed and then rejected Megan. The MySpace postings by Mrs. Drew resulted in Megan committing suicide by hanging herself in her closet.

Lori Drew was recently convicted of misdemeanor charges (Surdin, 2009); however on July 2, 2009 the U.S. District Judge George Wu acquitted her on the basis "that charges of computer hacking are best left up to a website owner to determine what is a crime" (Zetter, 2009).

Regrettably, no additional charges are able to be brought against Drew, since this type of harassment was not yet covered by any existing state laws. Subsequently, in July 2008,

Megan's home state of Missouri passed a bill that "updates state laws against harassment by removing the requirement that the communication be written or over the telephone." The new bill now covers harassment from computers, text messages and other electronic devices (USA Today, 2008). The movement to punish Cyber bullying quickly gained momentum and by 2009, 13 states has passed similar laws (Surdin, 2009).

Remotely Accessed Webcams

Allegations are being made against the Pennsylvania Lower Merion School District that the school was using laptop computers, which were loaned to students to spy on them. The spying could be done by covertly and remotely activating the webcams on the laptops. The school officials claim that the remote activation of the webcams is a tracking device utilized to recover stolen laptops. The installation of the LANRev Trojan on all the loaned out laptops allowed the school to run scripts to monitor the laptop usage, ensure proper operation and to possibly halt what was being accessed.

Parents and students learning of the remote activation of webcams followed up with a lawsuit based on the fact that the software was being utilized without prior consent of the parents and students. "As the laptops were routinely used by students and family members while at home, it is believed that many of the images captured and intercepted may consist of images of minors and their parents or friends in compromising and embarrassing positions, including but not limited to, various stages of dress or undress" (Claburn, 2010).

The main issue for the students and parents is privacy and their need to be protected from being spied on while in their homes.

8 COURSE RESULTS

Student Evaluations

Students were encouraged to provide comments, suggestions and feedback anonymously during the last class period. The student's written feedback and comments included the following:

"I never realized the ethical aspects of computers and technology before this class. Now I can distinguish an ethically wrong situation from a right one."

"Class was very interesting. I found that the subject of ethics is much more involved than I had originally thought".

"I liked the in-class discussions. Good class overall".

"I learned a lot in this course and enjoyed the discussions and learned more from discussions than the lectures".

"The course was very beneficial to me in understanding the scope of computer ethics, and the course format was good".

"I learned that I can learn a lot from my fellow students and I appreciate their opinions. I learned how to open up in the class discussions and found that there were other techies like me who like the same subjects."

"I learned about current events for computer and technological advancements and what should be done for control and enforcement of it".

"Great Class, well taught, manageable workload. I learned a lot about the subject and enjoyed the class discussions".

"Work load of four assignments was reasonable for a one credit course"

"Keep the relaxed nature of the class atmosphere. It is a break from the monotonous text book centered learning".

"I thought the class was great".

Other students provided the following suggestions for improvements:

"I would suggest one group project to help people think about ethics problems with more dimensions".

"Class meetings every week would be better".

"An improvement would be post more articles and topic selections."

"Provide more coverage of ethical principles and theories".

9. SUMMARY AND CONCLUSIONS

Professional practice of Computer Science and Information Technology consists of both technological knowledge and the skillful application of that knowledge guided by ethical standards

(Gotterbarn, Miller, 2009). The course utilized case studies to illustrate the tradeoffs between

technical issues, legal issues, economic issues, stakeholder interests and ethical principles. This paper provided many useful resources such as an overview of ethical theories, pedagogy, research topics, web sites, and grading rubrics.

The Megan Meier case illustrated that legal and policy systems simply have not kept up with the changes to technology and latest ethical challenges such as Cyber Bullying. Other examples where the legal and policy system have not kept up with the challenges of misusing technology are illustrated with the rising problems of identity theft, phishing attacks and other means of defrauding the gullible public such as charity web sites, which are frauds. Students need to understand the legal solutions to ethical issues and develop appreciation for when the legal solutions address the ethical problem and where the legal solutions fall short (Dark, et al., 2008).

The use of current event case studies provided students with many realistic situations and students can begin to understand the "shades of gray" of an ethical quandary. Some ethical dilemmas involve principles, while others are related to consequences, and still others correspond to virtues (Quinn, 2006). Case-based analysis allows students to think creatively imagining the features that would make a decision or action unambiguously right or wrong. Some of the decisions may be based on utilitarian principles, duties, rights, or virtues (Quinn, 2006).

The use of ethical current events improved student engagement and increased student interest, motivation and participation in discussions. Additional benefits of including the current event component are:

- "The content of the course assignments remains fresh.
- The risk of student generated "paper files" that are recycled every semester are reduced thereby cheating is also reduced.
- Course material of ethical considerations is relevant and directly applicable to current events with consequences affecting real people, and real companies.
- Examples are realistic and a naturally occurring case study, with all of its real world messiness is on display.

- Content is broader and more diverse and can include an international perspective" (Hare, 2008).

The technology will keep evolving and advancing at an ever-increasing pace. "Our reliance on networks and interconnected systems pose new threats and present new challenges, requiring us to find new ways of working" (Landau, 2008).

Cyber ethics must be taught with a pedagogical approach that allows students to examine their personal ethical beliefs, in the broader explicit context of right and wrong. (Dark, et al., 2008). The course content must address the ever-changing environment of existing technical, professional, legal and cultural values.

Instead of being black or white, global values, especially those of business and technology, are invariably tainted in complex shades of gray. Computer Ethics is arguably, the only field of study in which CIS and IT students are compelled to formulate and defend their own opinions on public issues. "Software developers in particular potentially wield immense virtual power and should be mindful of their artifacts' long-term consequences and their works' social context" (Lenarcic, 2003).

"If computer experts don't act in a manner that garners and maintains public trust, then the field and its potential to create enormous benefit will not be fully realized. Progress will be slowed and diverted as outside regulations jump in and the public has mixed experience" (Johnson, 2008).

In conclusion "With great power comes great responsibility." (Roosevelt, F., D., Zevin, B. D, 1946).

10. REFERENCES

- Associated Press, (2008, July 1), Missouri Internet Harassment Bill Passed After MySpace Suicide, USA Today.
- Basse, S., (2003), *A Gift of Fire: Social, Legal, and Ethical Issues for Computers and Internet*, Second Edition, Prentice Hall, Upper Saddle River, New Jersey.
- Brinkman, B. 2009. The heart of a whistleblower: a corporate decision-making game for computer ethics classes. SIGCSE Bull. 41, 1 (Mar. 2009), 316-320. DOI=<http://doi.acm.org/10.1145/1539024.1508979>
- Chao, L. (2010, January 26), World News: Beijing Hardens Rebuttal on Internet Policy --- In Onslaught of Commentaries, State Media Call the U.S. Hypocritical and Google a Pawn in American 'Ideology War'. Wall Street Journal (Eastern Edition), p. A.13. Retrieved May 15, 2010, from ABI/INFORM Global. (Document ID: 1947361361).
- Claburn, T., (2010), School Allegedly Spied on Kids in their Homes, Information Week.
- Claburn, T., (2010), FBI Investigating Web Spy cam, Information Week.
- Dark, M., Harter, N., Morales, L., and Garcia, M. A. 2008. An information security ethics education model. J. Comput. Small Coll. 23, 6 (Jun. 2008), 82-88.
- Gaudin, S. (2007), "Estimates put the T. J. MAXX Security Fiasco at \$4.5 Billion", Information Week, May 2, 20007.
- Gotterbarn, D. and Miller, K. 2009. Introducing professional computing issues into the CS curriculum ACM committee on professional ethics. J. Comput. Small Coll. 25, 1 (Oct. 2009), 59-60.
- Haag, S., Cummings, M., (2009), *Information System Essentials*, (3rd. Edition) McGraw-Hill Higher Education,
- Hare, B. K. 2008. Implementing a writing-intensive C.S./I.T. ethics course. J. Comput. Small Coll. 24, 1 (Oct. 2008), 76-82.
- Harris, C. E., Jr., Pritchard, M. S., Rabins, M. J.,(2004), *Engineering Ethics: Concepts and Cases*, Third Edition, Wadsworth Publishing.
- Hollander, R., (2010) Computer Ethics The Ethics Beat, Communications of the ACM 53, 3 (Mar. 2010), 28-29. DOI=<http://doi.acm.org/10.1145/1666420.1666433>
- Homkes, R. and Strikwerda, R. A. 2009. Meeting the ABET program outcome for issues and responsibilities: an evaluation of CS, IS, and IT programs. In Proceedings of the 10th ACM Conference on Information Technology Education (Fairfax, Virginia, USA, October 22 - 24, 2009). SIGITE '09. ACM, New York, NY, 133-137. DOI=<http://doi.acm.org/10.1145/1631728.1631764>

- Jézèquel, J. M., Meyer, B., (1997) "Put It in the Contract: The Lessons of Ariane, IEEE Computer, 30, 129-130.
- Johnson, D. G. 2007. Computer Professional Ethics in Theory and in Practice. In Companion to the Proceedings of the 29th international Conference on Software Engineering (May 20 - 26, 2007). International Conference on Software Engineering. IEEE Computer Society, Washington, DC, 4-5. DOI= <http://dx.doi.org/10.1109/ICSECOMPANION.2007.27>
- Johnson, D. G., (2001), *Computer Ethics*, Third Edition, Prentice-Hall, Upper Saddle River, N. J.
- Johnson, D. G. 2008. Computing ethics Computer experts: guns-for-hire or professionals? Communications ACM 51, 10 (Oct. 2008), 24-26. DOI= <http://doi.acm.org/10.1145/1400181.1400190>
- Jones, K. C., (2008, May 19), Missouri Legislators Outlaw Cyber Stalking, Information Week
- Landau, S. 2008. Privacy and security: A multidimensional problem. Communication, ACM 51, 11 (Nov. 2008), 25-26. DOI= <http://doi.acm.org/10.1145/1400214.1400223>
- Patchin, J. W., and Hinduja S., (2006), Bullies move beyond the schoolyard: A preliminary look at Cyber bullying, Youth Violence and Juvenile Justice, 4:148.
- Payne, D. and Landry, B. J. 2006. A uniform code of ethics: business and IT professional ethics. Communications of ACM 49, 11 (Nov. 2006), 81-84. DOI= <http://doi.acm.org/10.1145/1167838.1167841>
- Pollard, S. and Duvall, R. C. 2006. Everything I needed to know about teaching I learned in kindergarten: bringing elementary education techniques to undergraduate computer science classes. In Proceedings of the 37th SIGCSE Technical Symposium on Computer Science Education (Houston, Texas, USA, March 03 - 05, 2006). SIGCSE '06. ACM, New York, NY, 224-228. DOI= <http://doi.acm.org/10.1145/1121341.1121411>
- Quinn, M. J. (2006), Case-Based Analysis: A Practical Tool for Teaching Computer Ethics,. In Proceedings of the 37th SIGCSE Technical Symposium on Computer Science Education (Houston, Texas, USA, March 03 - 05, 2006). SIGCSE '06. ACM, New York, NY, 520-524. DOI= <http://doi.acm.org/10.1145/1121341.1121503>
- Quinn, M. J., (2006), *Ethics for the Information Age*, Second Edition, Addison-Wesley, Reading MA.,
- Roosevelt, Franklin D. & Zevin, B. D. 1946 Nothing to fear : the selected addresses of Franklin Delano Roosevelt, 1932-1945 / edited, with an introduction and historical notes, by B. D. Zevin. Foreword by Harry L. Hopkins, New York
- Reddy, S. 2004. Should computer scientists worry about ethics? Don Gotterbarn says, "Yes1!". Crossroads 10, 3 (Apr. 2004), 5-5. DOI= <http://doi.acm.org/10.1145/1027321.1027326>
- Shain, A., (2007), Breaches of cards on pace for record: Recent break-in shows vulnerability of security, Knight Ridder Tribune Business News. Washington: Jan 21, 2007. pg. 1.
- Sherman, C. A. 2007. Ethics: making it real for information technology students. J. Comput. Small Coll. 22, 3 (Jan. 2007), 168-174.
- Spinello, R. A., (2003), *CyberEthics: Morality and Law in Cyberspace*, Second Edition, Jones and Bartlett, Sudbury, MA.
- Surdin, A., (2009), In Several States a Push to stem cyber-bullying. The Washington Post.
- Tavani, H. T., (2002) Applying an Interdisciplinary Approach to Teaching Computer Ethics, *IEEE Technology and Society Magazine*, Fall 2002, 32-35.
- Tavani, H. T., (2007) *Ethics and Technology Ethical Issues in an Age of Information and Communication Technology*, (2nd Edition), Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
- Todt, R., (2010), PA School Official Defended in Webcam Spy Case, Bloomberg Business Week
- Wagner, C. G., (2008), Beating the Cyber Bullies: Targets of taunting need help

turning the tables on tormentors, The
Futurist.

Zetter, K., (2009, July 2), Judge Acquits Lori
Drew in Cyber Bullying Case, Overrules

Jury, Retrieved March 23, 2010 from
[http://www.wired.com/threatlevel/2009/07/
drew_court](http://www.wired.com/threatlevel/2009/07/drew_court)

Appendices

Appendix I – Professional Organizations Code of Ethics

ICCP Code	ACM Code	AITP Code
ICCP Prin. 1: The IT professional will embrace a high standard of skill and knowledge	ACM Prin. 1: ACM members should act with integrity	AITP Prin. 1: AITP members should promote management's understanding of information processing methods and procedures
ICCP Prin. 2: The IT professional will maintain a confidential relationship with people served	ACM Prin. 2: ACM members should strive to increase their competence and the competence and prestige of the profession	AITP Prin. 2: AITP members should uphold the high ideals of the AITP, cooperate with each other and treat each other with honesty and respect
ICCP Prin. 3: The IT professional will recognize public reliance upon the standards of conduct and established practice	ACM Prin. 3: ACM members should accept only those assignments for which there is reasonable expectation of achieving the requirements or specification of the project and perform his assignments in a professional manner	AITP Prin. 3: AITP members should participate to the best of their abilities in the dissemination of knowledge pertaining to the general development and understanding of information processing and should not use knowledge of a confidential nature to further their own interests. AITP members should not violate private or confidential information entrusted to them or that they may gain access to
ICCP Prin. 4: The IT professional will observe an ethical code	ACM Prin. 4: ACM members should act with professional responsibility	AITP Prin. 4: AITP members should uphold the educational institution's ethical and moral principles
	ACM Prin. 5: ACM members should use specialized knowledge and skills for the advancement of human welfare	AITP Prin. 5: AITP members owe trust to their employers to guard the employers' interests and to advise the employers wisely and honestly
		AITP Prin. 5: AITP members should respect their countries and the chosen way of life of those countries and act accordingly

Appendix II – Grading Rubric for Cyber Ethics Report

GRADING RUBRIC				
	D	C	B	A
POINT SCORE:	10	15	20	25
Criteria	Non-performance	Basic	Proficient	Distinguished
Students identify ethically relevant facts that together provide a comprehensive summary of the ethical issues raised in the literature.	Leaves out facts that are ethically relevant. Organization and List of Ethical Issues is Not Easily Identified.	Includes facts that are ethically irrelevant or only marginally relevant. Organization and List of Ethical Issues Needs Improvement.	Includes most of the ethically relevant facts. Organization and List of Ethical Issues is easily understood and refined.	Creates an excellent assignment demonstrating high competency. All ethical issues are clearly identified.
Students identify the stakeholders and their different viewpoints. They justify their claims using ethical arguments as well as isolate potential stakeholder conflicts.	Stakeholders viewpoints left out, justification of claims and potential conflicts are poorly made. Possible Conflicts not identified.	Only Some stakeholder's viewpoints mentioned, justification of claims and potential conflicts are partially made. Possible Conflicts are partially included.	Almost all stakeholders are included , explained, and justified. Almost all stakes and potential conflicts are included, explained, and justified.	All stakeholders are included , explained, and justified. All stakes and potential conflicts are included, explained, and justified.
Student correctly uses problem categories (disagreement, & conflict) to classify the ethical components. The ability to uncover the ethical issues that are embedded in complex, concrete situations.	Identification of problem types employed incorrectly, incompletely, or in a confused way. Problem classification is not relevant.	Problem classification is not directly relevant to the case and misses significant ethical elements in the case	Problem classification is, for the most part, relevant to the case. Problem classification covers most of the significant ethical elements in the case	Problem classification is highly relevant to the case and insightful. Problem classification covers comprehensively the ethical elements in the case.
Creates document that is clearly written and generally free of grammatical errors.	Does not have good format and does not create a document that is clearly written and generally free of grammatical errors.	Follows the format guidelines or creates document that is clearly written and partially free of grammatical errors.	Follows format guidelines and creates document that is clearly written and generally free of grammatical errors.	Follows format guidelines and creates document that is clearly written, well organized, and completely free of grammatical errors.

Appendix III - Web Resources

Other relevant web sites that have information on the social implications of computer use including computer crime, ethics, security measures, privacy, employee monitoring, and relevant topics are as follows (Haag, 2007):

General

www.eos.ncsu.edu/eos/info/computer_ethics - a good site for information on various issues of proper and improper use of computer resources.

www.cpsr.org/ - the Web site of Computer Professions for Social Responsibility contains links to information on various aspects of computer usage.

Ethics and Computer Crime

www.acm.org/constitution/code.html - the Association for Computing Machinery's (ACM) code of ethics.

www.techtv.com/cybercrime - the companion Web site of the TV cable network with information on computer crime, legislation, privacy issues, and so on.

www.consumer.gov/sentinel - Federal Trade Commission site that has statistics on complaints from Web users.

Legislation

www.complaw.com - a law library that provides information on laws in existence and proposed on privacy, monitoring, etc.

aspe.hhs.gov/admsimp/final/pvfact2.htm - Health and Human Services department fact sheet on the new federal law protecting patient's health information.

Privacy

www.privacyfoundation.org - site has detailed information on privacy issues.

www.eff.org - the Electronic Frontier Foundation offers some helpful guidelines on privacy and discusses some questionable marketing tactics.

epic.org - the Electronic Privacy Information Center has information on privacy and links to all sorts of privacy tools that you can use to protect yourself.

Defensive Tools

www.grc.com - the Gibson Research Corporation Web site has software that can test your computer's vulnerability to outside intrusion.

www.opt-out.cdt.org - the Center for Democracy and Technology has information on tracking services and links to opt-out pages for many Web sites.

www.fbi.gov - the Federal Bureau of Investigation's (FBI) Web site where you can file a complaint.

www.ftc.gov - the Federal Trade Commission's (FTC) Web site has lots of information on how to protect yourself on the Internet and how to file complaints.

www.nasaa.org - the North American Securities Administrators Association site with links to sites in all 50 states that track investment fraud.

www.website101.com/Privacy_issues.html - Small Business Privacy Tutorial on SpamFilter

Computer Ethics on World Wide Web: <http://www.ethicsweb.ca/resources/computer/index.html>

Computer Ethics Institute: http://www.brookings.edu/its/cei/cei_hp.html

Writing and Analyzing Ethics Cases: <http://cnx.org/content/m15991/latest/>

Appendix IV – Sample References for Cyber Ethics Report

T. J. Max Credit Card Breach

TJMAX1.doc (30.5 Kb)

Second Article On T J Max Credit Card Breach

TJMAX1.doc (30.5 Kb)

Wal-Mart Customer Data

walmart-customer data.pdf (128.541 Kb)

Iron Mountain Missing Data

IronMountain-Missing-Data.pdf (22.948 Kb)

FBI Carnivore Internet Surveillance

FBI-Carnivore-Update.pdf (21.359 Kb)

Power Grid Security

power grid security.pdf (58.895 Kb)

E-Commerce Trust

e-commercetrust.pdf (709.856 Kb)

Chinese Censorship

Chinese-Censorship-Microsoft.pdf (56.456 Kb)

Spyware Phishing Overview

SpyWare-Phishing-Overview-PRINT.pdf (74.013 Kb)

Visa Credit Card Operations

Visa Credit Card Operations.pdf (212.291 Kb)

E- Commerce Security

E-CommerceSecurity.ppt (2.374 Mb)

Gartner E-Commerce Trust

gartner.docx (14.992 Kb)

IBM Copyright infringement

IBMcopyright.doc (28 Kb)

Megan Meier Cyber Stalking

Cyber StalkingMeganMeier.doc (29 Kb)

Cyber Security

cybersecurity.pdf (98.286 Kb)

Email Phishing Example

Emailphisingexample.ppt (478 Kb)

Data Protection

DataProtection.pdf (512.936 Kb)

Washington Post Article on Cyber Attackshttp://www.washingtonpost.com/wp-dyn/content/article/2010/02/17/AR2010021705816_pf.html

Appendix V –Cyber Ethics Report Topics

Identity Theft

- Benefits and Risks of E-commerce and Internet Shopping
- Internet Scams / False Charity Sites
- Electronic Data storage of Birth, Marriage, Death Certificates
- Recommendations to Prevent Identity Theft
- Case Examples of Who, When, What Happened
- Laws Against Identity Theft
- Statistics – How Frequent is Identity Theft, Who are the Victims, Victim Profiles
- Size of the Problem, Volume of Crimes, Monetary Value of Crime
- Criminal Prosecuted and Sentenced
- What is legally being done by government?

Internet Crimes/Computer Security

- Viruses/SPAM
- Spyware
- Phishing
- Hacking
- Security of Government Computers and Records
- LDAP Security Risks
- Trojan Horses
- Deep Packet Inspection of Email and Internet Usage
- Bandwidth Throttling
- What are Laws Against It
- What is being done legally by government
- Statistics - How Frequent, Who are the Victims, Size of Problem, Volume of Crimes
- Criminals Prosecuted, Sentenced
- Recommendations to Prevent It
- Government Security Regulations regarding computer usage for Department of Defense

Cyber Bullying/ Cyber Stalking

- Megan Meier Case
- Social Networking Sites
- Internet Dating Sites
- Parental Responsibilities
- Laws Against It
- Prosecution of Mrs. Drew
- Recommendations to Prevent It
- Should Laws Be Changed?
- What security should be on social networking sites

Wireless Hacking

- Recommendations to Prevent It
- Case Example - Who , When, What Happened
- What are Laws Against It
- Statistics - How Frequent, Who are the Victims, Size of Problem, Volume of Crimes

Internet Bandwidth Throttling

- What are the consequences to consumers?
- What are the justifications made by ISPs?
- What are the new laws regarding this?

- Recommendations about what should be done in the future?

RFID Tags

- Consumer Privacy
- Passports
- Inventory Management: Company Policies, Improved Inventory Management, Efficiency Cost Savings

Employee Monitoring

- Computer Usage
- Email Monitoring
- Video Surveillance
- Employer: Productivity, Loss of Information, Provide Safe and Secure Work Environment
- Employee: Invasion of Privacy, Stress, Loss of Motivation
- Case Example - Who , When, What Happened
- Laws Against It
- Recent Court Cases

Search Engine Privacy

- Google/Yahoo/Microsoft
- Google subpoenas Consumer Public Views
- Case Example - Who , When, What Happened
- What are Laws regarding this?
- Record retention periods
- Why do companies do this?
- Recent Court Cases for death of wife

Chinese Government Censorship of Google/Microsoft

- What are positions of Google and Microsoft companies?
- What are positions of Chinese government?
- Is this in conflict with American Standards?
- What is public opinion in America?
- Pros/Cons of censorship

Customer Relationship Management

- Walmart Customer Purchasing History usage of RFID for Inventory
- Usage of Point of Sale Transactions for Data Warehousing and Analytics
- TJ Maxx Security Breach
- Consumer Privacy , Corporate Profitability Inventory Efficiency etc.

Homeland Security/Airport Security

- Full Body Scanners
- Government monitoring of email/phone calls
- Passenger Profiling
- Power Grid Security
- National Security
- Invasion of Privacy/Discrimination
- Health Issues of scanners
- What are the laws?
- Case Example of Government Invasion of Privacy
- Airport & Airline Concerns

Internet Music/Intellectual Property

- Case Examples

- RIAA vs. Verizon - Digital Millennium Copyright Act DMCA
- Private Bay - Peer to Peer Sharing Swedish Case
- Music Company Point of View
- Consumers Point of View
- Creative Commons and "Jay-z / Beatles Gray Album"
- Napster History

HIPPA Records Electronic Medical Records

- Medical Identity Theft
- Falsified Billing Records by Doctors
- Consumer Privacy
- Company Policy - Improved Accuracy, Efficiency, Cost Savings
- Case Example - Who , When, What Happened
- What are Laws?

Software Piracy

- IBM vs. BGC - Informix Data Base Licenses
- Lost Revenue Facts
- Poorer Economies in Under-developed countries cannot afford full software prices.