



Online Ethics Center
FOR ENGINEERING AND SCIENCE

Training Graduate Students in the Responsible Conduct of Research - A case study in building the Ethics Education Library

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Description

This article describes the graduate student training in RCR that was implemented during the creation of the Ethics Education Library. It includes a bibliography of topics discussed including Codes of Ethics, Intellectual Property & Copyright Issues, Fair Use, Privacy & Security, and Site Accessibility.

Body

In August 2008, the U.S. Senate passed the American COMPETES Act which contained a section requiring all undergraduate, graduate and postdoctoral students working on projects funded by the National Science Foundation and other government agencies to receive training in the responsible conduct of research. As a response to this, CEES-NAE and the Center for the Study of Ethics in the Professions at the Illinois Institute of Technology started a project in the summer of 2009 to redesign the Online Ethics Center and to build the Ethics Education Library, a collection of articles, syllabi, and instruction methods for teaching students about the responsible conduct of research. We also sought to develop an effective method

for engaging the graduate students working on designing the database with the ethical issues involved in a project of this kind. The approach we decided to take was to try and weave ethics into the daily work done by the students, helping them become aware of issues as (or before) they arose, and discussing possible solutions as a team.

We did this through a combination of formal and informal methods. Almost every week, from September 2009 to August 2010, we had a 30 minute meeting about the progress of the project, and at least once a month I included an ethical topic on the meeting agenda that needed to be addressed as the building of the database moved forward. This included issues such as privacy, (protecting personal information collected from members of the site), copyright (how to protect the copyright of the full-text of publications in the database), accessibility for individuals with disabilities or for users with limited technology available, etc. I started out with a list of topics I knew we would have to address, and added to the list as new issues arose. We began these discussions by focusing on ways we could address these issues in the current project, and then broadened the discussion to take a wider view of how these issues came up in other areas of professional practice. We looked at professional codes of ethics to see how these standards applied to the work they were doing on the database, and I encouraged the student assistants to take some time to read a number of relevant articles and talk about these issues after our weekly meeting ended. The ethics sessions during these meetings were sometimes slow, sometimes lively, but often students would talk to me informally at the water cooler or as they were heading home and relate how they had dealt with some of these issues in former internships or jobs.

One of the topics that we ended up discussing the most was questions about intellectual property. Because the database focused on gathering published and unpublished materials on ethics education, copyright and fair use laws were a big concern, especially as we planned to include abstracts as part of all database records. We discussed the nuances of fair use and how we could include abstracts for two meetings, and discovered we could do so by writing them ourselves or abridging existing ones in some cases with database providers' permission. Conversations about the differences in copyright laws and what constitutes plagiarism in China, India and the United States took up another meeting session, and are still continuing in the library today, as students bring in news articles to post on the CSEP bulletin board and blog. These discussions also helped

convince one student to change his approach in designing a logo he been working on for the Ethics Education Library. His original ideas incorporated images that he had pulled from Google Image Search and after an analysis of his design, the team agreed that his use could not be considered transformative, and therefore his design could easily be seen as violating copyright laws. I also learned quite a bit about how computer scientists and their employers handle issues of intellectual property from these discussions, and meetings and conversations on this topic and others often felt like a knowledge swap between disciplines, with me often coming out the wiser.

I also tried to bring in recent news articles relating to issues we had discussed, scanning newspapers like the Wall Street Journal and New York Times for updates on the Google Books lawsuit or information about user privacy and Facebook. A handful of students talked with their faculty advisors and professors about some of these issues, both in general and how they related to the building of the EEL, and faculty were often helpful in providing their own viewpoint and recommendations to the students. After an ongoing struggle with security for the site, one of the Center's graduate assistants came back with the name of an excellent new open source CAPTCHA program that allowed us to include a challenge-response test that kept spammers from attacking the database. After we got this software installed, our level of spam decreased to almost nothing.

Students working at CSEP can never really escape ethics, working as they do surrounded by books and materials on that subject, but this strategy helped the project team consider ethical issues as a major part of the design process. By discussing ethics on an almost weekly basis, students quickly began to feel comfortable talking about these issues with their colleagues and myself. It helped students, who all had strong backgrounds in computer science, step outside their daily work and look at the larger picture, and helped me to better understand how ethics can be better be integrated into projects of this kind . Once students felt comfortable talking about the issues, my role was limited to directing discussions and providing resources when more information was needed. The students were naturally interested in topics that connected directly with the design process, and helped spread this attention to ethics as they talked with co-workers, friends and faculty while finding solutions to our privacy and copyright questions. Paradoxically, while designing the database to hold the 3,000 plus ethics materials we have collected, these materials served as only a starting point for weaving ethics into the actual design process. The real ethics education occurred away from the computer

screen and around the meeting table or water cooler as we debated and discussed.

Bibliography of topics discussed:

Codes of Ethics

Association for Computing Machinery Code of Ethics and Professional Conduct

<http://www.acm.org/about/code-of-ethics?searchterm=code+of+ethics>

ACM/IEEE-CS Software Engineering Code of Ethics and Professional Practice

<http://www.acm.org/about/se-code>

See more codes of ethics in the CSEP Codes of Ethics Online Collection

http://ethics.iit.edu/indexOfCodes.php?cat_id=6

Davis, Michael. 1991. "[Thinking Like an Engineer: The Place of a Code of Ethics in the Practice of a Profession.](#)" *Philosophy and Public Affairs* 20(2):150-167.

The author addresses three myths about engineering codes of ethics. First, that the first codes of engineering ethics put loyalty to the client or employer ahead of the public interest. Second, that engineering codes of ethics should be mere moral guides rather than legalistic rules, and finally, that codes of engineering ethics are too vague to provide much guidance.

Gotterbarn, D., K.W. Miller. 2009. *The Public is priority: making decisions using the software engineering code of ethics.* *Computer*. 42(6): 66-73.

The software engineering code of ethics and professional practice encourages software engineers to undertake positive actions and to resist pressures to act unethically. Article discusses how this code can be used to make decisions that come up in the daily work of software engineers.

Intellectual Property & Copyright Issues

U.S Copyright Office <http://www.copyright.gov/>

Web site of the Library of Congress Copyright Office, including basic information about what a copyright is, what it protects, and how copyright works in regard to

electronic media.

Creative Commons <http://creativecommons.org/>

A type of license used in education and for many kinds of open source projects that allows authors to protect their intellectual property while allowing others to share, remix or reuse their work.

Berti, J. 2009. Copyright infringement and protection in the internet age. *IT Professional*. 11(6): 42-45.

Discusses the complexity of protecting copyright in an age of increasingly complex internet-based technologies, and offers some insight on how to reduce problems of copyright infringement. As the EEL collects already-published materials, students needed to understand the basics of copyright and strategies for protecting submitting authors' intellectual property.

Castro, Helder, Artur P. Alves and Carlos Serrão. 2010. A new paradigm for content producers. *IEEE Multimedia*. 17(2): 90-93.

Discusses how the Internet, digital consumer technologies, and sophisticated collaborative online tools such as blogs, social websites, and wikis have severely disrupted established intellectual-property regimes. The authors explore the economic implications and challenges posed by this change, the failure of the Digital Millennium Copyright Act, and offers a possible solution to these issues.

Rockman, H. 2004. The Digital Millennium Copyright Act of 1998 (DMCA): An overview. In *Intellectual Property Law for Engineers and Scientists*. Hoboken, NH: IEEE. 405-415.

An introduction to the DMCA that discusses its implications for protecting the copyright of electronic materials, and its potential chilling effect on research into encryption techniques, reverse engineering used by engineers in the development of software, and its potential limit on the dissemination of education and research. This volume also covers many other important aspects of intellectual property and copyright that engineers should be familiar with.

Fair Use

U.S. Copyright Office - Fair Use <http://www.copyright.gov/fls/fl102.html>

A short description of the doctrine of "fair use" as defined in sections 108 through 118 of the Copyright Law Title 17, U.S. Code. Questions about fair use arose as we

thought about how we could include abstracts into the database without violating authors' copyright, and if we could potentially include part of a text in the database without having to ask for permission.

Columbia University Copyright Advisory Office

Designed for academics, librarians and researchers, this web site includes the Fair Use Checklist that focuses on factual circumstances that are important for the evaluation of a contemplated fair use of copyrighted works. Also includes information about copyright in general, how to get permission to use a copyrighted work, and information about other special topics such as the Google Books settlement.

Stanford University Libraries - Fair Use

http://fairuse.stanford.edu/Copyright_and_Fair_Use_Overview/chapter9/index.html

A more detailed analysis of the fair use doctrine that I have pointed students towards when they have questions about using graphics, logos or other ideas that they would like to use in the overall design of a web resource.

Privacy & Security

Angwin, Julia and Tom McGinty. 2010. Personal details exposed via biggest U.S. websites. *Wall Street Journal* 7/31/2010. 256(26): A1-A2.

<http://online.wsj.com/article/SB10001424052748703977004575393173432219064.html>

Discusses the efforts of large U.S. web sites including Comcast and Google to record personal information about consumers who visit them. The authors report on their analysis for the 50 most popular sites in the U.S. and found they collectively installed over 3.100 tracking files in users' computers. A majority of these files are created by companies that gather and sell information.

Earp, Julia B. et al. Examining internet privacy policies within the context of user privacy values. *IEEE Transactions on Engineering Management*. 52(2): 727-737.

Describes a study that compared the privacy policies on data collection, use and disclosure of fifty different web sites with the privacy values and expectations of over 1000 internet users. The researchers found a large discrepancy between what privacy policies currently state and what users deem most significant.

Karahasanovic, Amelia et al. 2009. Ensuring trust, privacy and etiquette in Web 2.0 Applications. *Computer* 42(6): 42-49.

After doing analysis of three user studies focusing on Web 2.0 applications, the authors discuss the most important privacy and security factors that users of these applications were concerned about, and how software and web developers can go about developing applications that give users control over privacy settings, and meet the expectations and needs of the community being served.

Sheehan, Kim Bartel. 2002. Toward a typology of Internet users and online privacy concerns. *Information Society*. 18(1): 21-32.

Reports the results of a survey that discusses the privacy concerns of internet users based on different factors such as age and education. The researchers found that individuals with higher levels of education are more concerned about their privacy, that younger users tend to be more pragmatic, and that users over the age of 45 tended to be not worried at all about privacy on the Internet, or extremely concerned.

Site Accessibility

Resources on Accessible Web Design

<http://www.washington.edu/doit/Resources/web-design.html>

Developed by the University of Washington's Do-IT Center (Disabilities, Opportunities, Internetworking and Technology), this is an extremely good list of resources to help web developers create pages that are accessible to everyone, including this with disabilities. Includes a number of web tutorials, a large number of related articles and case studies, a collection of relevant guidelines and standards, and standards validation and accessibility evaluation tools.

[Section 508.gov](http://www.section508.gov)

Developed by the U.S. General Services Association's IT Accessibility and Workforce agency, this web site provides information for web developers, employers, and individuals with disabilities about Section 508 of the Rehabilitation Act which was enacted to help eliminate barriers in information technology, open new opportunities for people with disabilities, and encourage development of technologies that will help achieve these goals. It includes laws, policies and standards as well as a large collection of links to technology tools and resources for both developers and users of information technology.

W3C Web Accessibility Initiative

The World Wide Web Consortium is organization that seeks to develop standards for web pages and browsers, and has been a leading voice in developing standards that web designers can use to make sure their site is accessible to people with special needs.

Adam, Alison and David Kreps. 2006. Enabling or disabling technologies? A critical approach to web accessibility. *Information Technology & People*. 19(3): 203-218.

This article provides an analysis of the continuing problem of web accessibility for disabled people. The authors discuss the need for web developers to develop an understanding of how the social construction of a disability model may tend to mask the embodied, lived experience of disability, and how this understanding can help designers make the web more accessible for all.

Carter, Jeff and Mark Markel. 2001. Web accessibility for people with disabilities: an introduction for web developers. *IEEE Transactions on Professional Communication*. 44(4) 225-233.

Provides an overview of the topic of web access for people with disabilities, including a review of the four basic disabilities that web developers should account for in their design, the relevant laws regarding web access, and efforts made by the World Wide Web Consortium and other professional societies to encourage web accessibility. The article ends with a list of resources.

Curran K, N. Walters and D. Robinson. 2007. Investigating the problems faced by older adults and people with disabilities in online environments. *Behavior and Information Technology*. 26(6) 447-453.

This paper reports the results of a study that evaluated a select number of web sites to see how they complied with accessibility guidelines set out by the Web Accessibility Initiative. The researchers found that the majority of sites were inaccessible to individuals with disabilities, though only minor modifications would be needed to make them accessible. The authors conclude by discussing reasons for lack of compliance, and some possible negative outcomes to companies who fail to comply with guidelines of this kind.

Jaeger, Paul T. and Xie Bo. 2009. Developing online community accessibility guidelines for persons with disabilities and older adults. *Journal of Disability Policy Studies*. 20(1): 55-63.

Using guidelines developed for ensuring website accessibility, this paper seeks to

develop a series of guidelines to online communities and Web 2.0 applications to help make these online resources available to a wider percentage of the population. The article explores the social, policy and developmental issues of the accessibility of online communities.

Rights

Use of Materials on the OEC

Resource Type

Instructor Materials

Parent Collection

Essays on Ethics Instruction

Discipline(s)

Research Ethics

Teaching Ethics in STEM