

DOING ETHICS ACROSS THE CURRICULUM: THE EAC TOOLKIT

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INTRODUCTION¹

EAC (ethics across the curriculum) has reached the stage where it can benefit from a supportive, online environment. The EAC Toolkit has been designed to provide just such an environment that will serve, not only as a repository for existing EAC resources, but also help to draw together the expertise and experience in moral pedagogy that is distributed throughout the EAC community. Funded by the National Science Foundation, the EAC Toolkit provides an interactive online forum where collaborators meet to develop instructional materials that integrate ethics into the occupational and professional curriculum.² This essay will characterize EAC as a vital pedagogical approach to teaching ethics to professional and occupational students, present the Toolkit as an online environment that supports EAC efforts, describe how Connexions® authoring and dissemination tools support the values and activities of the Toolkit, and how the Toolkit complements and extends EAC faculty development workshops.

ETHICS ACROSS THE CURRICULUM³

Ethics across the curriculum, an established pedagogical approach for more than twenty years (Weil 131-136), works by incorporating ethics modules into mainstream practical and professional courses. If strategically placed and skillfully taught, these modules lead to a demonstrably powerful approach to moral pedagogy (Davis 111-120). EAC meets the challenge of integrating ethics into the occupational and professional areas by deploying a holistic and interdisciplinary strategy built upon the collaborative efforts of an ethically empowered faculty (Cruz, Frey 545-548).

EAC is holistic because it synthesizes distinct activities around the goal of providing occupational and professional students with a comprehensive and contextualized moral education. Three such activities include ethics modules incorporated into occupational and professional courses, faculty development workshops, and freestanding courses. Ethics modules supply breadth; they are taught by instructors in the occupational and professional areas and strategically integrated with course content. Because they take place in gateway courses, they can potentially reach all students. Faculty development workshops and retreats generate expertise by building and sustaining interdisciplinary collaborations; the pedagogical materials these workshops develop capture this expertise which is then transmitted to students through course modules and ethics micro-insertions. Freestanding courses provide a concentrated and intense exposure to ethics and allow committed students to explore occupational and professional ethics in depth. Taken all together, this “hybrid” approach to EAC integrates these different strategies and activities to produce the best of all pedagogical worlds.

EAC is built on interdisciplinary collaboration. Because it is addressed to students in the occupational and professional disciplines, it must convey real world relevance; its modules should confront students with the ethical challenges they are likely to face. Delivering relevance requires close collaboration between ethicists and practitioners. This collaboration is also required to identify moral best practices in the occupational and professional areas and to bring these into the classroom for students. Academic turf wars can make this interdisciplinary collaboration difficult. But EAC’s interdisciplinary demands can serve as the occasion to set academic specialization aside and explore the benefits of interdisciplinary collaboration. Its interdisciplinary challenge is also an opportunity.

EAC provides strategies to ethically empower occupational and professional students and their teachers. “Empowerment” has different senses. Employees in business firms become empowered when they participate in organizational decision-making as do citizens when they vote, protest, and run for openly accessible offices. Practitioners in the occupational and professional domains are empowered in a different sense by the knowledge and skill they acquire through their education. Their natural powers become extended to the point where they can dominate others. Knowledge here is power, and power creates moral responsibility. Can society trust that those who have technical power will

choose to exercise it responsibly? William May, for example, ponders what those with technical power will do when nobody is watching (May 408). May's test, which has been used to explore the moral character of professionals, also provides a key learning objective for a pedagogy of ethical empowerment.

Providing occupational and professional students with the skills and knowledge to pass May's test, to empower them to behave morally when nobody is watching, poses a challenge to moral pedagogy that EAC is especially equipped to handle. It provides contextualized materials that help students anticipate and respond to the moral challenges that arise in their particular occupation or profession. It employs instructors and practitioners in these disciplines as ethics mentors who then share their experience, knowledge, and skill on how to prevail in the face of moral challenges. And it informs the curriculum with moral best practices that have been designed, tested, and refined in the crucible of hard, real world experience. Ethical empowerment is both an element of EAC (because moral pedagogy incorporates the ethically empowered as exemplars and mentors) and a target of EAC (because occupational and professional pedagogy seeks to ethically empower its students).

EAC is an established approach to moral pedagogy in the practical and professional areas and the variant described above has proven effective in many contexts. The next part of this paper will focus on improving a key component of EAC: the generation, capturing, and dissemination of expertise in practical and professional ethics pedagogy. To do this, the authors have developed an EAC Toolkit. How does a Toolkit that employs tools of information management fit into the broader pedagogical picture? Can it heighten and intensify the components of EAC already described?

THE EAC TOOLKIT CONCEPT

The EAC Toolkit has just completed its preliminary phase. Project leaders have built and tested a prototype on an existing online platform, the Connexions® OER (Open Education Resource) platform developed through Rice University. The Toolkit concept stands for a process that integrates activities with values over background constraints by employing implementation strategies. Each of these "moments" will be outlined in this section. The penultimate section of this paper, entitled "EAC Toolkit Assessment," will describe how Connexions® has both

facilitated and constrained the development of the EAC Toolkit concept in the form of the current prototype.

Toolkit Specifications: Activities

The Toolkit supports three activities fundamental to capturing and disseminating knowledge and expertise in ethics pedagogy: browsing, commenting, and authoring. These “telescope” the efforts of different stakeholders⁴ toward the generation, capture, refinement, and dissemination of EAC knowledge and experience.

- *Browsing.* Stakeholders browse Toolkit content to survey EAC knowledge and expertise. During the planning phase of this project, Toolkit developers catalogued the efforts of a Mechanical Engineering professor to find ethics modules online that he could integrate into his courses. Such resources exist but sorting through the vast repositories of online information proved difficult. Thus, the Toolkit should help EAC stakeholders find an efficient route to ethics resources and materials directly relevant to their course content; it should pass what Toolkit designers have dubbed the “Torres Test” in honor of this engineer. Browsing is facilitated by generating taxonomies that classify and sort materials. Cataloguing key words, module abstracts, and “lenses” all help to generate these taxonomies. Furthermore, the activity of browsing itself generates information (called metadata) that can be fed back to improve browsing. This metadata can be used to enhance successful browsing and filter out practices that impede it.
- *Toolkit Stakeholder Commentaries.* Browsing activities create opportunities for stakeholders to interact with EAC content through reviews, commentaries, evaluations, and rankings. For example, an English as a Second Language instructor in Monterrey, Mexico, interested in teaching English to Spanish speakers and integrating ethics activities into her class, found the module, *Theory Building Activities: Mountain Terrorist Exercise* (m13764), in the Toolkit. She refashioned this module into a discussion exercise to help her students practice English (Vargas). Sharing new, innovative uses of ethics modules with the EAC community is vital to that community’s development. The *Knowledge Hub*, a project housed at the Technological Institute of

Monterrey, allows individuals to develop and share profiles on Open Education Resource content (Knowledge Hub). In the language of knowledge management, this online platform helped this professor to share her transaction with a module and generate valuable metadata. This metadata, in turn, can be fed back into the Toolkit to stimulate further innovation by utilizing a process called “informating” (Zuboff 9).⁵

- *Editing and authoring modules.* Toolkit *authors* originate content and publish it in an openly accessible online space. Authoring here is more like sharing; authors publish content so that others can use it, add value to it, mix it with other content, and adapt it to different contexts. The Toolkit should support these processes by creating a space where content can be reshaped and enhanced by a collaborative group of experienced and skilled EAC community members; it should also provide authoring tools to support this collaborative activity.⁶

Toolkit Specifications: Values

In addition to supporting activities, the Toolkit also utilizes knowledge management to realize and integrate core values. These include (1) balancing intellectual property with sharing, (2) integrating privacy and free speech, (3) establishing responsibility for content quality, and (4) realizing “stickiness.”

- *Balancing intellectual property with sharing.* The Toolkit and its members recognize and respect the contributions of participants through practices that protect intellectual property such as copyright. But intellectual property should be balanced with other practices that facilitate sharing content. An “attribution” copyright license made available through the *Creative Commons* helps bring about this balance. It allows others to “copy, distribute and transmit the work” as well as “remix” or adapt it to different contexts. The primary restriction is that the user “must attribute the work in the manner specified by the author or licensor.” Furthermore, this attribution should not imply that the originating author “endorses or is responsible for the new use” (Creative Commons).
- *Integrating privacy and openness.* Toolkit contributors need privacy while developing and experimenting with new module ideas. A

toolkit should provide this protective space. But privacy must be balanced with openness since the Toolkit is built around the dissemination and sharing of EAC expertise and knowledge. Content management tools can support privacy by creating zones of restricted access. Other tools can support openness and transparency by creating openly accessible repositories of materials to facilitate sharing and dissemination. To bring about this balance, the EAC Toolkit has turned to Connexions®, an online platform that offers work spaces (for private development of content) and a Content Commons (for sharing and dissemination of content).⁷

- *Responsibility* (for content): Many will measure the Toolkit according to the standard set by traditional content published offline such as textbooks and peer reviewed articles in scholarly journals. Here, responsibility for content falls primarily on the originating author with subordinate roles played by editors, peer reviewers, and users. In the Toolkit, the author merely originates content; responsibility for its quality and integrity becomes collectively exercised by the EAC community as others pick up this content, examine it, contextualize it, and refine it through repeated uses. This requires new practices, habits and attitudes, but these need not be created out of nothing. Precedents exist of communities able collectively to design complex, practices and procedures through open content development. According to Sunstein, open source software development (e. g., Linux and Apache) works because it collects dispersed knowledge and expertise (172). But, since this process can also go awry, it requires good will, collaboration, and commitment; financial incentives, reputation and altruism all help but, even when taken together, still do not guarantee good outcomes. It is still not completely understood why these collaborative development projects work when they work (Sunstein 173-174). Thus, relocating responsibility for content on the EAC community taken collectively, represents a key value challenge for the EAC Toolkit.⁸
- *Sticky Network*: Developing a sustainable Toolkit requires attracting and retaining qualified participants and contributors. Those drawn into the Toolkit through browsing must find opportunities for maintained participation and contribution. The

network it creates must be “sticky.” According to Bush and Tiwana, networks become “sticky” when they build relational capital, establish reputation, and personalize interaction (Bush, Tiwana 68-69). Relational capital, built on social capital, emerges from and further solidifies trust building activities (Colman 300-321; Putnam 18-24). For example, trust is built when community members make judicious use of one another’s content and refrain from using it without proper acknowledgement. Copyright features such as the Creative Commons attribution license help establish this as the default routine. Trust and social capital also emerge when community members provide one another with helpful, positive feedback on content. While there is no easy way to guarantee trust, it can be built partially upon other values like those described above: privacy, transparency, property, sharing, and responsibility. The second component of stickiness, reputation, emerges out of mutual respect between community members. Reputation can be established, for example, as a result of offline conference presentations. The Toolkit can build on this by helping those who share materials during conferences to disseminate further their materials online through Toolkit modules. Reputation, thus, emerges by building an online-offline synergy that takes advantage of positive conference exchanges by continuing them in the virtual space of the Toolkit. Finally, personalization helps or hurts community development depending on the context. Personalizing involves developing features that create and sustain community identity (such as shared rituals and symbols) as well as activities that create community traditions and aspirations (such as bulletin boards that share information on community achievements and new projects). These features can personalize a network (and strengthen the underlying community) by highlighting past accomplishments, present collaborations, and future aspirations. But pushed too far, they can isolate a community and bar the entry of new members. Personalization features are “sticky” when they secure community identity yet set up borders porous enough to allow transactions with other communities.

Toolkit Constraints: Resource, Interest, and Technical

In a design problem, constraints pose conditions that channel and, at times, oppose the implementation of design specifications. The Toolkit

has to be built for and integrated into specific contexts. Resource, interest, and technical constraints can give rise to obstacles that impede the implementation of the Toolkit in these contexts. (1) Resource constraints can impede the realization of the Toolkit because participants have only limited time to contribute to EAC efforts. Motivating them to set aside time poses a major challenge. Enhancing Toolkit “stickiness” will help here; software tools that generate relational capital, reputation, and personalization will also motivate individuals to participate in Toolkit development. (2) Academic turf wars that undermine the interdisciplinary cooperation constitute interest constraints. Implementation of the toolkit requires anticipating and defusing these reactions before they can gain traction and oppose implementation. (3) Technical constraints arise from the software tools available to support Toolkit values and activities. Web pages display content but constrain because they are static. Blogs generate commentaries and metadata but often lack filters to separate out low quality content (Sunstein 223-223). Wikis support collaborative authoring and editing but require continuous editing to maintain quality and monitoring to prevent vandalism (Sunstein 222-223).

In its first phase, the EAC Toolkit has chosen Connexions® as a platform to test in terms of these constraints. Built on Rhaptos software, Connexions® uses extensible markup language (XML) to “exhibit the links among related modules, display images and videos, launch interactive applets, support myriad output formats, enable powerful search mechanisms, and display and print clear and attractive mathematics (using MathML)” (Connexions 8). Connexions® provides authoring tools, a repository for EAC resources called a “Content Commons,” an editorial feature called a “lens” that allows for selecting out high quality content, and a “Creative Commons Attribution License” that provides authors with an attribution license.⁹

In summary, implementation efforts must respond strategically to the resource, interest, and technical constraints that are inherent in the different socio-technical systems. Creating imaginative responses to such challenges develops and maintains a robust toolkit.

Toolkit Implementation Strategies: Open content development and Commons-based Creativity

As was said above, Toolkit activities result in an online experience substantially different from offline counterparts. For example, offline publication consummates activities such as submitting proposals, having

them reviewed, authoring drafts, and intensively editing them into camera-ready copy. The Toolkit, on the other hand, employs a strategy of open content development. Publishing is different in the Toolkit because it represents a preliminary stage where unpolished content is released to the EAC community for further development; publication initiates rather than terminates the content development process. In essence, publishing becomes sharing where one author (an originating author) transfers content to other authors (transforming authors) who refine, rewrite, add value to, and/or remix the original content. Theoretically, this sharing never ends. Success stems, not from the initial product, but from initiating processes of open content development and continuous improvement.

Open content development of EAC content is closely connected to and dependent upon the availability of an accessible repository of shared materials termed an “intellectual commons” (Lessig 19-23). Connexions® was chosen to support the Toolkit, in part because it offers a “Content Commons” where interested individuals can browse for materials that fit their interests and needs. If treated as raw material receptive to further development, this content provides the basis for creation, collaboration, and sharing. This process of commons-based creativity complements open content development.

EAC TOOLKIT MODULE CONCEPT

Modules “capture” EAC knowledge and skill to make ethics integrations possible in occupational and professional classes. The EAC Toolkit draws upon two kinds of module, the student module and the instructor module. Student modules capture and utilize EAC best practices while instructor modules compile pedagogical information and strategies to help interested teachers integrate ethics into their classes. This section will discuss both kinds of module and outline how they interact.

Student Modules

Student modules are ethics integrations based on class handouts, cases, scenarios, textbook exercises, pedagogical activities, and other “best practices.” Written primarily for university students, these modules also reach a broader audience that includes high school and junior high students, teachers of practical and professional ethics courses, occupational and professional instructors, and individual browsers

interested in independent study. Connexions® provides content management tools that help develop student modules including work groups (restricted areas in which authors develop content), browsing tools (key words, subject areas, and lenses that help browsers find modules), course management tools (that organize individual modules into broader collections), and content management features (that collect and integrate materials). Student modules, thus, draw together materials found online and offline into learning activities. In general, student modules have five sections:

- *Introduction.* This section summarizes content and states learning outcomes. Frequently, ethics cases are used to draw students into the content and context of the module. These can be briefly outlined in the space provided in the module and then supplemented by links to more detailed accounts on and offline. For example, the module, *Ethical Issues in Graduate Research* (m31972), uses the Enron and Tuskegee cases to introduce issues in research ethics. The Enron case links to materials found at the PBS News Hour site (PBS) while the Tuskegee case links to a full case narrative found online (Ethics in Classroom). The introductory section, thus, “intro-duces,” in the literal sense of the word, by *leading* the student *into* the content of the module.
- *What you need to know.* This section focuses on content by providing background knowledge, definitions, outlines of ethical approaches, summaries of pertinent technical materials, and frameworks to help students structure and organize module material. The module, *Value-Based Decision-Making in Gilbane Gold* (m15783), defines key moral values, outlines the movie’s plot, and offers character profiles. It builds on these core materials by linking to the NIEE (National Institute for Engineering Ethics) website which provides the script of Gilbane Gold, PowerPoint presentations, and discussion questions (NIEE). One especially useful link connects to numerical exercises on the case developed by environmental engineer, Mark Holtzapple, that explore creative solution possibilities to the problems raised in the case (Pritchard, Holtzapple 217-230). In general this section either provides the knowledge necessary for reaching the module’s learning objectives or directs students to content displayed elsewhere, *offline* in textbooks, movies, and journal articles as well

as *online* in ethics web sites, YouTube® videos, and online journals.

- *What you are going to do.* This section provides activities to help students learn, practice, and appropriate the module's central concepts, principles, and subject matter. It employs pedagogical practices such as discussion (formal and informal), role-playing, dramatizing, writing (formal and informal), debating, and presenting. For example, the "What you are going to do" section in the module, *Value-Based Decision-Making in Gilbane Gold* (m15783), presents four exercises in which students in small groups (1) make a decision playing the role of the main character, David Jackson, (2) analyze and rank "alternate endings" to the video's story line, (3) debate the different conceptions of business social responsibility raised in the video, and (4) rank the video's main characters in terms of their leadership abilities. These exercises target the four AACSB ethics themes of responsibility of business in society, ethical decision-making, ethical leadership, and corporate governance (AACSB 10).
- *What you have learned.* In this section, students find activities and content to help them work toward closure. For example, the *Ethics of Team Work* module (m13760) profiles moral values and discusses group pitfalls. Students form work teams and develop plans for realizing the values and avoiding the pitfalls. In a final, closeout evaluation at the end of the semester, groups revisit their goals, discuss obstacles encountered, and assess their responses. This closeout, self-evaluation provides students with closure on their group experience. Other means for achieving closure include reflection on the learning experience, self-assessment activities, module assessment exercises, and appendixes with links and references for further study.
- *Metadata.* Connexions® provides tools at the end of each module that aid in the collection, organization and dissemination of metadata. These include (1) how to cite the module in a bibliographical reference, (2) the terms of the module's copyright, (3) how to modify the content and disseminate modifications as a "derived copy," and (4) how to retrieve earlier published drafts to chart a module's evolution ("version history"). Registered browsers can rate modules (on a scale of one to five) and contact the author if they have questions or

comments. In general metadata tools collect information pertinent to teaching and improving student modules.

Instructor Modules

Written to help those wishing to teach the corresponding student module, instructor modules link to the student module and provide a forum for sharing the experience of teaching it. By making use of derived copy and version features from Connexions®, instructor modules can document and disseminate different uses and adaptations of student modules. They also provide pedagogical support by displaying teaching commentaries, pedagogical suggestions and advice, assessment strategies, and suggestions on how to prepare for teaching the student module. They motivate and guide the capture, development, and dissemination of EAC pedagogical best practices.

Instructor modules can be created by the author of the corresponding student module or they can be created by a colleague or peer who observes the teaching of the student module. Methods of participatory observation help to uncover and share the pedagogical skills and experience that go into teaching EAC. (Observers can highlight teaching strategies that the teacher may not be explicitly aware of.) Peer collaboration in developing instructor modules provides a non-threatening way to bring about continual improvement in teaching practical and professional ethics.

Instructor modules appear in a variety of forms including the following:

- *Introduction.* This section links to the corresponding student module and summarizes its content.
- *Pedagogical Objectives.* This section identifies the content and skill objectives targeted by the student module. These include stimulating moral imagination, recognizing moral issues, and eliciting a sense of moral responsibility (Callahan 61-94). Modules can also be tied to accreditation criteria such as AACSB's ethics themes or ABET Criteria 3, a-k. Because they compile assessment data on student modules, instructor modules can be used to document compliance with accreditation efforts and provide "assurance of learning."
- *Pedagogical Strategies.* This section outlines the pedagogical strategies employed in teaching the student module including

lecture, assigned readings, writing, presenting, discussion, and debate.

- *Assurance of Learning.* This closing section provides instruments to assess what students have learned from the student module. Some instructor modules include attached student evaluation forms. They can also link to other modules that offer an assortment of assessment activities and instruments.

THE ETHICS BOWL COLLECTION: A TOOLKIT CASE STUDY

Walking through sample Connexions® modules and courses will give a better sense of the Toolkit and clarify the student and instructor module concepts. It will also help readers navigate through what is, at first, a complex environment. This section will discuss the student and instructor modules collected together in the course, *Using the Ethics Bowl to Integrate Ethics into the Business and Professional Curriculum* (col10411).

There are four useful ways to find EAC Toolkit courses and modules in the Connexions® Content Commons.

- Each module and course has a unique online address. Visiting <http://cnx.org/content/col10411/latest/> opens the Ethics Bowl collection and its constituent modules. To help with browsing, Connexions® modules are assigned identification numbers starting with “m” (for module) followed by a five-digit number code. Courses or collections in Connexions® combine modules in different ways to form larger knowledge entities. These are assigned identification codes consisting of “col” (for collection) followed by a five-digit number code. In this example, the authors have grouped several Ethics Bowl modules together into the collection, *Using the Ethics Bowl to Integrate Ethics into the Business and Professional Curriculum*. The URL provided above embeds the Ethics Bowl course identification code as col + 10411.
- Another route to EAC Toolkit Ethics Bowl content is through the Connexions® search engine. For example, one opens the Connexions® home page <http://cnx.org> and types “ethics bowl” into the search window. A list of modules and courses will appear whose titles correspond with the search parameters. For example, the first module to appear in a search carried out at this writing was *Practical and Professional Ethics Bowl Activity: Follow-Up*

In-Depth Case Analysis (m13759). The course, *Using the Ethics Bowl to Integrate Ethics into the Business and Professional Curriculum*, was the seventh. The Connexions® search engine also permits searches by subject, popularity, language, and author/title.

- Connexions® provides a lens feature that groups together modules and courses that are of special interest to a given community. The EAC Toolkit lens, *Collaborative Development of Ethics Across the Curriculum Resources and Sharing of Best Practices*, can be found at <http://cnx.org/lenses/eactoolkit/eactoolkit>. Its content includes the Ethics Bowl collection mentioned just above.
- The EAC Toolkit website <http://eactoolkit.com> is currently being redesigned and will eventually link to the Ethics Bowl course and its modules. At this time, the Toolkit website does profile modules that are in the Ethics Bowl collection such as *Ethics of Team Work*.

The Ethics Bowl collection arranges its content into five sections or units: (1) Emerging out of the IIT EAC Workshop, (2) Integrating the Ethics Bowl into Professional Ethics Classes, (3) Preparing for the Ethics Bowl, (4) Ethics Bowl Extensions, and (5) Building and Sustaining an Ethics Bowl. Course sections further organize and sort Toolkit content. The sections of a collection are displayed at the top of the screen under “Table of Contents.” Clicking on a unit or section title opens links to the included modules. This provides a more direct way of browsing through a collection than clicking on the start, next, and previous buttons that restrict one to browsing sequentially through the collection, module by module.

Browsing Connexions® can be initially confusing because it provides multiple routes of access to content. Casual exploration and a small amount of practice will quickly pay off; browsers will eventually find these multiple routes useful because they provide flexible pathways to desired content.

EAC TOOLKIT FACULTY DEVELOPMENT WORKSHOPS

The EAC Toolkit complements and completes EAC faculty development workshops. These workshops help motivate and commit faculty in the occupational and professional disciplines to EAC by giving them the confidence and skill needed to carry out ethics insertions in

their classes. This section reports on how the Toolkit supports faculty development workshops and how Connexions® provides authoring and disseminating tools to sustain EAC accomplishments beyond the duration of the workshop.

EAC faculty workshops have evolved to realize four objectives: (1) issue identification, (2) EAC module demonstrations, (3) developing new EAC modules, and (4) sharing workshop results.

- *Issue Identification:* Faculty members from the occupational and professional domains have a good idea of the day-to-day ethical issues that arise in the practice of their areas of teaching and research. This part of the workshop is devoted to eliciting this knowledge. To prime the process, workshops begin with the participants discussing ethics cases. (Some workshops start with issues surveys that participants have previously completed.) Having participants identify ethical issues empowers them and gives them a sense of ownership. It also keeps EAC efforts up to date by capturing new issues and tracking changes in old ones.
- *EAC Module Demonstrations:* Time and competence pose two obstacles to EAC. Many instructors would like to teach ethics but are too busy teaching other things. Others can find the time but do not feel comfortable tackling these issues; they would rather delegate their teaching to the “experts.” Having peers demonstrate their successful EAC modules circumvents both arguments. Demonstrations move the discussion from *whether* EAC is possible to *how* it is accomplished. (1) An information systems professor demonstrates an exercise consisting of short scenarios revolving around computers and information systems. Students discuss whether the behaviors outlined in the scenarios are realistic, ethical, and contentious. To focus discussion, the instructor introduces three ethics tests: reversibility, harm, and publicity. (2) Another demonstration has students examine examples of digitally “enhanced” photos and discuss where to draw the line between acceptable and deceptive alterations. Module demonstrations motivate and empower participants to develop ethics activities for their own classes by providing templates to structure the development and contextualizing of new activities.

- *Developing EAC Modules:* Participants write out ideas for ethics activities on small note cards. After being divided into small groups, they share their ideas with others. Each group chooses one to develop in detail. Group module ideas are presented to the workshop plenary for sharing and feedback. This simple process has proven effective at generating new EAC modules which can be utilized in different ways. They can be (1) integrated into occupational and professional ethics courses as modules, (2) documented and assessed as learning outcomes in accreditation efforts, and (3) fed back into future faculty development workshops as demonstrations.
- *Sharing the Results:* Faculty development workshops are effective at jump-starting EAC. But they are less effective at sustaining EAC efforts and securing follow-up. Sharing EAC modules and experience, maintaining enthusiasm and commitment, and implementing workshop-wrought initiatives are difficult tasks and require support. For this reason, the Toolkit project team has generated faculty development workshop modules to serve as a focal point for further collaboration and documentation. One such module, *Faculty Retreat in Research Ethics—Modules and Issues* (m.32949), has been designed to disseminate the results of a faculty retreat in research ethics. It provides tables that capture the workshop process of writing ethics cases and modules in small groups. One table identifies the groups (and their members), summarizes the module ideas developed, and provides an open space for a future link when modules are finished and published in Connexions® or elsewhere. Another table sorts out modules according to the ethical issues instantiated. Referencing cases according to issues instantiated documents EAC accomplishments and highlights EAC challenges (as gaps in the table). Publishing retreat results in the EAC Toolkit continues the participants' collaborations and documents post-workshop efforts to complete module ideas, test them in the classroom, assess the results.

EAC TOOLKIT ASSESSMENT

The main thrust of this phase in Toolkit development has been to advance its conceptualization by building a prototype for testing over the Connexions® platform. This stage will culminate in a qualitative

assessment that outlines how Connexions® has both facilitated and constrained the Toolkit concept. This section will look at how Toolkit activities have been reconceptualized as well as how effectively Connexions® has supported the key values of property/sharing, privacy/transparency, responsibility, and stickiness.

Browsing

The Torres Test (mentioned above) has proven that something more focused and powerful is required by the Toolkit than just providing a repository over which occupational and professional instructors can browse. A direct route must be provided that links occupational and professional instructors with materials that are relevant to their EAC needs, located within their comfort zone, and geared to their teaching skills and pedagogical leanings. Hence, the Toolkit must empower a focused, highly specific search that, at the same time, provides both education and orientation. Connexions® search engines and lenses have helped bring about this reconceptualization. But even the best search engine cannot highlight material that does not yet exist. In its second phase, the Toolkit must identify content gaps and encourage members to fill these by authoring new content. Faculty development workshops can help here by devoting time to issue and need identification and then forming groups to develop content to respond to these issues and needs. Browsing thus poses challenges that must be met with a combination of online and offline strategies.

Commenting

The most useful and successful commenting platform has been provided, not by Connexions®, but by the Knowledge Hub project out of the Monterrey Technological Institute. This project identifies and catalogues Open Education Resource content through comprehensive module profiles that are easily accessible through a powerful and useful search engine. Profiles should include (1) cataloguing and rating content, (2) documenting module adoptions, and (3) useful pedagogical commentaries (Knowledge Hub). The Toolkit project team has also developed an EAC Toolkit website that allows for rating and commenting on modules. It too provides module profiles as well as links to the Connexions® Content Commons. At the time of this writing, the second version of the Toolkit website is still not up and running but should be by fall 2010.

Authoring

Authoring, as said above, is based on open source development and commons-based creativity. Connexions® provides work spaces and work groups (to which access is restricted by invitation), authoring tools (edit-in-place and full source editing), and copyright features (based on Creative Commons 3.0 attribution license) to support collaborative authoring and open source development of shared content. Commons-based creativity is supported by Connexions® features like the Content Commons, derived copy tools, and version history features. These enable access to a common repository of materials and resources for the purpose of modifying them in different and creative ways for further sharing. At the beginning of this project (2006) Connexions® authoring tools presented would-be authors with a substantial learning curve. The Toolkit project team has developed demos that have reduced this curve somewhat; these have been tested in several faculty development workshops. Moreover, as this project has developed, Connexions® has made several improvements in its authoring tools and has gone a long way toward reducing this learning challenge.¹⁰

Supporting Toolkit Values

(1) The Creative Commons Attribution License promotes property and sharing by balancing open access to EAC educational resources with flexible copyright options. The attribution clause recognizes the contribution of the originating author and preserves this link throughout the chain of modifications and derived copies. Yet the license is flexible enough to allow for modifications and alterations of the module as well as recognizing transitioning authors and the value they add. (2) Connexions® provides work space and work group environments to allow authors privacy while they collaborate on modules. This privacy is integrated with transparency through features that ease the movement of content from private to public zones. Authors easily transfer content from work spaces to the Content Commons through a “publishing” feature. They can just as easily “check out” content into work spaces for editing, rewriting, and substantive transformations that result in derived copies. This orderly movement back and forth between private and public spaces integrates the values of privacy and transparency. (3) As said above, authors are responsible for the quality of the content they publish but the Toolkit adds new authoring roles that range from originating to improving to recontextualizing content. Module

commentaries supported by features in Connexions®, the Knowledge Hub, and the EAC Toolkit website all drive efforts to improve module content. Connexions® ‘lenses’ further allow communities to collect modules and recommend them to their members. These lenses serve as ‘filters’ that select modules of higher and deselect those of lower quality. (4) Finally, Connexions® offers features for a ‘sticky network,’ that is, a network that draws in volunteers and motivates them to perform essential community sustaining activities. While Connexions® has not been entirely successful in supporting this value, Toolkit investigators have developed other means toward a sticky network such as the EAC Toolkit website.

CONCLUSION

The EAC Toolkit provides an online repository of materials and resources in occupational and professional ethics. Its network draws together a diverse group of stakeholders into a single, cohesive community. As repository and network, the Toolkit supports the development and dissemination of EAC components and activities including ethics modules (for occupational and professional courses), freestanding courses in occupational and professional ethics, and faculty development workshops. Finally, it supports the continued development and improvement of these by inaugurating a design process that employs the implementation strategies of open content development and commons-based creativity to realize (and reconceptualize) activities (browsing, commenting, authoring/sharing) and values (property/sharing, privacy/transparency, responsibility, stickiness) over situation-based constraints. This paper has characterized the Toolkit in these terms and has outlined its development during its first phase.

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NOTES

¹ This paper is closely tied to two presentations and the authors would like to thank the hosting societies and session participants. “Developing Engineering Ethics Across the Curriculum Best Practices: The EAC Toolkit” was presented at the 11th Annual Conference of the Society for Ethics Across the Curriculum at the Rochester Institute of Technology, Rochester New York on November 14, 2009. On March 5, 2010 the panel, “Assessing an Online Platform for Developing and Disseminating Resources in EAC: The EAC Toolkit” was carried out at the annual meeting of the Association for Practical and Professional Ethics held in Cincinnati, Ohio. Panelists were Marilyn A. Dyrud, Chris Papadopoulos, Halley D. Sanchez, Aury M. Curbelo, José A. Cruz-Cruz, and William J. Frey.

² Collaborative Development of Ethics Across the Curriculum Resources and Sharing of Best Practices, National Science Foundation, SES-0551779.

³ The approach used at UPRM is one of many EAC approaches. Its developers call it a hybrid approach because it integrates free standing ethics courses with ethics modules incorporated into occupational and professional courses. For a useful taxonomy of different kinds of EAC, see Davis 2004. The EAC Toolkit has been tested in the context of the UPRM hybrid model but it has been designed to support other EAC approaches as well.

⁴ Toolkit stakeholders include students, practical and professional ethicists, instructors in the occupational and professional areas, professionals and practitioners, and agents from industry and government.

⁵ Zuboff emphasizes this reflexive quality of informing in the following quote: “Information technology ... introduces an additional dimension of reflexivity: it makes its contribution to the product, but it also reflects back on its activities and on the system of activities to which it is related. Information technology not only produces action, but also produces a voice that symbolically renders events, objects, and processes so that they become visible, knowable, and sharable in a new way.” (Zuboff 1989)

⁶ The Toolkit can also help individuals “contextualize” the content shared by the EAC community. For example, EAC community members share their exercises and cases in conference presentations. The Toolkit can add value by highlighting instances where others have adopted these materials. It can also document changes made to fit content to different educational contexts and teaching styles. Thus, the Toolkit can enhance retreat and workshop activities by generating a use-history of EAC resources that document how the EAC community has used, shared, and modified these resources.

⁷ The section, “EAC Toolkit Assessment,” (page 16) discusses how well Connexions® carries out this task.

⁸ As with other paragraphs in this section, this paragraph on the value of responsibility sets the problem. The penultimate section of the paper, “EAC Toolkit Assessment,” provides a preliminary assessment on how well this value has been supported in the prototype developed over the Connexions® platform. At this point, the problem is posed in terms of collective authorship where responsibility for content is distributed across several individuals playing different authoring roles that range from originating content, to adapting it to different contexts, to refining content as metadata is generated

through different uses. Content is improved as others review and comment on it. *Knowledge Hub* module commentaries and profiles, for example, effectively carry out these functions. Responsibility for content also involves setting up a series of filtering activities where extraneous content is eliminated.

⁹ A preliminary assessment of Connexions® as a Toolkit platform has been carried out in the penultimate section of this paper, the section entitled “Toolkit Assessment.” To anticipate, Connexions® does respond adequately to the constraints mentioned in this section. It also goes a long way toward resolving many of the problems mentioned above with more conventional tools such as web pages, blogs, and wikis. But during the four years of this project, several online platforms have emerged that challenge Connexions® on some of these technical constraints. A Phase II EAC Toolkit project that develops a new prototype on some other platform would provide further depth and information from which to assess comparatively the effectiveness of Connexions®.

¹⁰ The “What’s New” section of the Connexions® web page (cnx.org/news) provides several examples of recent innovations made to improve authoring tools.

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