OWNERSHIP OF DIGITAL COURSE ARTIFACTS Who Can Access and Use Your Words, Images, Sounds, and Clicks?

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Digital learning environments are spaces in which data are shared, generated, and recorded. At the end of an online course, a rich collection of digital artifacts are left behind by the instructor and learners. Some artifacts are intentionally created learning materials and assignments, some are the products of class interaction in discussion spaces, and some are the data recorded by servers documenting each user's path through the learning environment. This paper addresses the ownership and use of these data points, taking into consideration both privacy and intellectual property rights as well as ethical issues. Examples of how instructors might proactively address these issues and support student awareness throughout all phases of a course are discussed.

When learning is facilitated in a digital environment, every action—whether synchronous or asynchronous, and visual, aural, or text based—generates digital information that is stored somewhere for later use. Within any online course, both instructors and learners knowingly or unknowingly create a wide range of digital artifacts, including communication data from within a learning community, documentation of learning processes and outcomes, and assessment and evaluation data. In the course of creating, sharing, viewing, and interacting with each artifact, additional "clickstream" data (a recording of the user's mouse clicks) are generated. Regardless of the specific origin and form of this information, this data is recorded in a digital format, and stored for an indeterminant and open-ended time frame. This continuing storage of data, and the surrounding uncertainty of who might be able to access it, raises important concerns about this data's ownership and use.

Throughout this article, "data" may be broadly defined as *any digital artifact generated or shared by participants in the online learning environment*. Some data qualifies as intellectual property with associated rights attached to the originator. Other data may be

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The Quarterly Review of Distance Education, Volume 17(4), 2016, pp. 5–19 ISSN 1528-3518

private, whether *legally* (e.g., personal information as designated by the Family Educational Rights and Privacy Act in the United States) or by *perception* (e.g., information shared with a defined set of people in a semi-private online location; Elm, 2009). In spite of the serious and potentially far-reaching issues surrounding storage and ownership of data created in the online learning environment, instructors and students may not even consider the issue until some event arises when they feel their rights have been violated. This paper therefore explores issues surrounding the classification and use of online learning data, and provides suggestions for how intellectual property and other data-related issues may be *proactively* addressed throughout an online course.

DATA GENERATED IN ONLINE COURSES

Long-established norms govern many peoples' expectations of what will happen to the data generated in a class context. In a face-to-face situation, the default expectation historically has been that within-class interactions will not be recorded aside from personal, hand-written notes focused on assisting the individual with learning course-related information. In other words, *class members have traditionally understood that an instructor's lecture and comments may be documented in writing, but have little expectation that the specific words or actions of learners in the classroom will be permanently recorded in any form, nor be accessible beyond its context of origin*. However, with use of digital technologies, realities have changed—even if individual learner expectations have not always responded in kind. Creating a digital recording of a face-to-face class is simple and inexpensive, and in higher education many students bring digital recording devices (e.g., smartphones and tablets) with them to class. Online classes are, by default, entirely recorded because all interactions take place in digital form and are hosted on a server.

Table 1, for example, addresses some of the ways in which information is presented and generated in different classroom settings, and the manner in which data surrounding that information may be recorded. Note that Table 1 does not focus on data related to items generated outside of class meetings, such as student papers and projects. These artifacts may be submitted for assessment in digital or analog formats, depending on the instructor's preference and specifications. If the artifact is digital (e.g., a word processing file), it is likely that both the learner and the instructor will retain a digital copy of the artifact for an indeterminate (and often, unspecified) amount of time.

As Table 1 depicts, all class environments, regardless of the amount of digital technology employed, constitute spaces where information is generated and consumed. The difference among these spaces relates to *what part* of the generated information is recorded, by *whom* it is recorded, and *with whom* it might be shared. In a face-to-face class, irrelevant information, such as a joke made at the beginning of class, or an interruption caused by nearby construction, may be noted in the moment but is highly unlikely to be recorded by anyone in attendance. In a class that is fully online and hosted within a learning management system, however, the minute details of every interaction in the course space are electronically recorded and documented by the computers and servers that are used to host the class. These details therefore will include not only course-pertinent data (assignments, grades, class communication, etc.), but also information shared by participants not directly relevant to the course topic (e.g., personal plans, or a joke), as well as clickstream data (e.g., counts of student accesses to different course materials).

INTELLECTUAL PROPERTY, PRIVACY, AND DATA USE

Institutions of higher education deal continuously deal with information from multiple perspectives. Faculty and students are simulta-

TABLE 1
Data Records From Learning Experiences Across Class Contexts

Class Environment	*Information Presented to Class*	*Information Generated During Class*	*Data Recorded*
Classroom without digital technology	• Learning materials • Verbal information/ instructor lecture	• Discussion (spoken words) • Items written on white-board	• Whatever students write in their notebooks
Classroom with digital technology	• Learning materials • Verbal information/ instructor lecture	• Discussion (spoken words) • Items written on white-board	• Whatever students type or record using their devices
Online class	• Learning materials (includes any pre-recorded lectures)	• Discussion (typed words, spoken word, video) • User actions within the learning environment	• Potentially everything—all contributions to the learning environment whether typed words, audio or video input, uploaded files, and user clicks—is recorded by the learning management system

neously consuming, transforming, creating, and disseminating information (Maxwell, 2004) in the pursuit of teaching, learning, and scholarship. In many instances, faculty and students are working with intellectual property. Intellectual property is the unique product of cognitive and creative work, and is covered by various legal protections that address the ownership and use of the products generated by that work. In order to qualify as intellectual property, the work must be concrete and documented (World Intellectual Property Organization, 2004). In other words, ideas shared in a conversation are not protected as intellectual property. When communicated in writing, the unique words used to express the idea may be considered intellectual property (Aaron & Roche, 2015). Similarly, information is not protected as intellectual property, but intellectual property laws cover tangible, unique work products that convey information.

The topic of intellectual property, when raised in an online learning context, typically conjures visions of learners as *consumers* of *other* people's intellectual property, with the major concerns being plagiarism and copyright violation (i.e., obtaining or distributing course materials in an illegal manner, preventing the copyright owner from receiving royalties). However, as noted above, learners also *generate* a tremendous amount of data within a class, some of which may fall within the realm of intellectual property. Instructors, too, participate in the creation and sharing of intellectual property with courses in a manner that extends beyond appropriate selection, attribution, and distribution of copyrighted materials. Discerning participant-created intellectual property from other types of course-generated data is useful because a different ethos may apply when determining how and by whom these types of information may be used and shared. For example, student papers are both intellectual property and private, since they are indicators of student performance. A class roster also is private, since it contains identifying student data. In the United States, student privacy rights are specified in the Family Educational Rights Protection Act. Student clickstream data, if identifiers are removed, would be neither intellectual property nor private. While a system administrator could acceptably use this

data to ensure the learning management system (LMS) is working properly or to identify which features are most frequently used, an instructor intending to use this data for assessment purposes might be ethically obligated to let students know that clicks constitute one component of their grades. Finally, should a researcher wish to access the clickstream data, approval of an ethics board is necessary to ensure that the students who generated the data would neither be identifiable nor suffer discomfort or harm.

Intellectual Property Concerns for Faculty

Intellectual property and privacy concerns have implications for how faculty members choose to share products of their own scholarly work with their students, particularly if that work has not yet been published or publicly presented. Intellectual property concerns historically have kept works in progress from being shared with the larger scientific community (Friesike, Widenmayer, Gassmann, & Schildhauer, 2014). However, in today's technological context, faculty members may use their own scholarly works in progress as teaching examples, sharing their scholarly and creative processes with students to teach via modeling. The conundrum is that sharing new ideas and drafts of otherwise unpublished work with a class requires trust that the work will be considered confidential, and shared no further than within the immediate learning context. The risks related to sharing unprotected ideas also exists in physical classroom settings, but are greatly magnified when all communication is digitized, and thus easy to save, redistribute, or repurpose.

Faculty members may also have specific concerns about protecting self-designed course materials that do not directly reflect or derive from their research or creative work. Although the copyright ownership and legal use of textbooks *may* be clear and well understood by most people using them (although this cannot be assumed to be true in many cases), the ownership and proper sharing and management of faculty-created materials is not.

Two issues are at work in this setting. The first concerns *whether course materials are considered intellectual property that might be protected by a copyright*. This question is partly raised by the manner in which these materials often are produced, used, and shared. Faculty members have a long history of sharing course materials and, aside from partnerships with publishing companies, typically have not sought to generate a direct profit from these materials. In a predigital era, sharing these materials was a paper-based affair. With the advent of online learning and digital storage of course materials on a university server, however, a conversation was initiated about the benefits of widespread sharing of course materials. The new ease of digital sharing also raised questions about authorship and ownership rights for these materials that, by technical definition, may be considered intellectual property. MIT's OpenCourseWare project, initiated in 2002, instigated some of this conversation about providing access (with proper attribution) to faculty-developed digital learning materials and artifacts. The OpenCourseWare project facilitated the open sharing of MIT course materials on the Internet. This process was a step toward democratizing education, establishing the idea that access to learning materials should be considered a basic human right (Caswell, Henson, Jensen, & Wiley, 2008). This step effectively shined a spotlight on intellectual property issues within the educational learning context.

Second is *the issue of who owns course-related intellectual property*. As Maxwell (2004) notes, there are clear tensions surrounding intellectual property in a university context. Faculty must navigate between individual and collaborative work, and between the production and transmission of knowledge, with lines often blurred on both fronts in a classroom context. Some faculty, for example, consider their syllabi and other materials to be *proprietary* products of their teaching labor (Greenhow & Gleason, 2015). In other

instances, such as when an institution provides significant resources specified for course development, the syllabus and other materials may be considered institutional property (for an example of a policy, see The Curators of the University of Missouri, 2016), while others, often educational institutions themselves, consider syllabi the property of the institution. Further complicating matters are faculty fears that if the institution and owns the course materials, then the faculty member may complete the intellectual labor of course design only to then be replaced by less expensive, and often less skilled labor for ongoing dissemination of the instruction (Noble, 1998). This valid concern arises within the larger holistic discussion of institution-faculty labor contracts. Historian David Noble (2002), a notorious critic of distance education, noted that course materials are not the equivalent of a course experience, but rather provide only a framework for learning. Although ownership of that framework may lead an institution to dismiss the faculty course designer and employ more economical labor to teach the course, the effect on course quality is uncertain. Instructional interactions are reliant on the intellectual capital of the teaching faculty member, and will therefore vary between faculty members. Less knowledgeable instructors may yield lower quality course interactions even when course design remains constant.

Returning to the issue of ownership and how it is determined, in the case where faculty members develop course materials for their own use in the classroom, they do so as employees of an institution. This relationship may initially sounds like a "work for hire" situation, but faculty members are not developing materials to be sold directly for profit, by either themselves of the institution. Unless otherwise specified, historically there has been little expectation that a faculty member's course materials would be seen by individuals not on the class roster or retained by a university after the faculty member departed (Noble, 1998). The American Association for University Professors has suggested that faculty members are tasked with being independent thinkers, and that consequently the "work for hire" model does not apply to course materials. Under this model, the American Association of University Professors believes intellectual property rights should be retained by faculty members (Springer, 2005). A recent study found that about half of all faculty members felt that such materials should be co-owned by the faculty member and the institution, with each entity possessing some rights for continued use beyond the expiration of the employment contract (Aaron & Roche, 2015). Historically, educational institutions have had policies delineating ownership of intellectual property created by employees, with ownership varying by type of intellectual property and the conditions under which it was created. Since the turn of the millennium these policies have begun to also factor in the role of faculty in generating pedagogical-oriented intellectual property (Biagioli, Jaszi, & Woodmansee, 2015), and address ownership of faculty-designed learning materials (Loggie et al., 2008). Policies in these areas, if they exist, are infrequently invoked and most likely to be addressed when individuals or institutions feel their rights are being violated.

Intellectual Property Generated During Learning Activities

Teaching involves more than just a syllabus, which outlines a course, and informational materials that organize and present the facts and concepts that students are expected to learn. Faculty may develop case examples, design new types of learning activities (e.g., a webquest; Dodge, 2015), and develop new methods for explaining or organizing learning content. These faculty innovations clearly are valued: educational publishers seek teacher-authors who will generate copyrightable and salable learning materials. These authors often develop the initial versions of these materials through their own teaching activities, designing solutions that meet their own needs. It is only at the point when their activities are

widely adopted and materials are distributed beyond their immediate classrooms that ownership typically becomes a concern.

Further complicating this matter are the points where a faculty member's teaching practice and scholarly research intersect, and the faculty member develops new ideas while teaching. To draw upon a personal example, in the process of trying to explain a concept to her online students, the author developed a framework for use in an online course. The framework involved a figure (a graphic file) and some surrounding text, both of which the author shared in a discussion post. The post itself bore the author's name; the graphic file, which could be downloaded and saved separately from the post, did not. The author's purpose at the moment of creating this framework was to facilitate learning. It was only after the author shared the framework and received feedback from students that she realized the framework would be useful in a manuscript on which she was working. The author then revisited the class discussion forums in which she had further refined the framework in response to student questions and comments. Although fully confident that the end product was owned solely by the author, the manner in which it was developed highlights the potential for ideas to be cocreated in multivocal spaces during the course of conversation (Kolko, 1998).

Intellectual Property Concerns for Students

The lens through which most students approach intellectual property in a course context is focused on ensuring that their coursework adheres to university policies governing academic integrity (i.e., not cheating or plagiarizing). Digital technology can act as both an aid and a hindrance in this area. Whereas plagiarism is easy to *accomplish* (enabled by search engines, online documents, and copy and paste capabilities), it is also easy to *detect* using tools that search for text matches between submitted documents and online sources, creating a virtual panopticon scenario (Zwagerman, 2008) in which every student contribution is potentially being monitored for plagiarism. The ideal, of course, is to teach students to appropriately cite sources and to instill the value of generating one's own original work for course submissions. However, as Zwagerman (2008) notes, the current system of imperfectly applied punitive measures does little to deter those who desire to plagiarize.

Shifting this lens to focus on student-generated intellectual property highlights an area that is least often considered by instructors and students alike, perhaps due to the perceived low monetary value or potential use of student-produced work beyond the course itself. University academic integrity policies come into play again at this point. There is a market for selling course papers, but the risk to those who sell and buy such content, if caught, is great. Additionally, most course papers and projects, no matter how well done, typically are not of great interest to the broader community. In other words, student-generated content is unlikely to be published or read by a wider audience than the instructor.

However, in some classes—particularly those involving innovation, business plans, and entrepreneurship—there is a real risk that students will share marketable ideas, and that their peers or someone else with access to the materials could steal those ideas (Katz, Harshman, & Dean, 2000). Whereas in a face-to-face classroom sharing may be limited to students hearing what their peers choose to share aloud during discussions or presentations, in an online class the students communicate in recorded messages and share documents and presentations in digital format, increasing the potential intellectual property theft. Additionally, there is a broader issue to be explored about *who owns ideas generated by undergraduate students in a class context*. Undergraduates are unlikely to be employed by a university to produce scholarly work, blurring the more clearly delineated definitions of intellectual property ownership and work-for-hire settings that exists for many graduate students

and faculty members (Little, Reid, & Litton, 2013). If an undergraduate student proposes or develops "the next great idea" in a class, and the idea is documented in a space owned by the university and further developed with input from faculty and other students, ownership of the idea may come into dispute. In this sense, the shared online space can both benefit and hinder the development of individual intellectual property, serving as a potential breeding ground for ideas while simultaneously blurring the ownership boundaries of such ideas.

Collaborative Intellectual Property

When students work together on group projects, they generate collaborative intellectual property. However, regular interactions on discussion forums and other course communication tools may also result in the coconstruction of ideas and content. Whereas in the first situation it is generally agreed upon that all contributing group members are authors of the final project, in the second situation, authorship may be less clear. Although students may claim their own forum posts as clearly their own intellectual property, such posts are often the result of interactions with other students in the forum. In the context of the original discussion archive, the collaborative development of the idea becomes visible. However, if one extracts the final, most synthetic post from the forum, the intellectual contributions of others may no longer be readily apparent.

Whether or not this situation is problematic is a matter of perspective. Norms are well established for citing the external, copyrighted sources that inform an idea, but not for guiding attribution to less formal influences. At the same time, the sharing culture that has developed alongside the rise of social media often challenges modern intellectual property law (Grinvald, 2015). In most cases, students and faculty are unlikely to find themselves in troublesome situations because the collaborative ideas and intellectual property carry little value outside the class context. However, the potential for disagreement exists in those few instances where an individual wishes to use, and financially benefit from, work generated in this context.

Higher education is not alone in the struggle to determine appropriate norms and procedures for collaborative spaces. Online multiplayer games are one context in which the conversation about shifting notions of intellectual property in digital environments is also taking place. Game creators own the rights to their games, but game players in networked, virtual worlds are often more than just leisurely planers. Players engage in intellectual labor that generates digitally recorded products within game worlds, and enhances the setting and game play for others. Their work is unique, and also possesses value. Grimes (2006) raises the question of who owns the rights to the products created by players, noting that these players may engage in the game without initially worrying about protecting their intellectual property. However, once the players have invested hundreds of hours producing something, they likely will want (and deserve) credit for their work.

In other popular culture settings, such as fan fiction, individuals have appropriated elements of fictional mass media and engage with it by coconstructing part of the next stage of the media or narrative (Downes, 2015). Although in this context there are clear concerns regarding the protection of and profits from trademarks, the practice nonetheless spawns new authors who are doing cultural and intellectual work. Kolko (1998) explored the issue of collaborative development of knowledge in virtual worlds, questioning the degree to which one can reasonable expect to own something that is cocreated and suggesting that we need to establish new means of assessing ownership for the polyvocal works generated through discourse and sharing in online spaces.

Transferring these ideas to the online classroom, and working within the paradigm of social constructivism and coconstructed knowledge, develops a fuller sense of the layering of intellectual property and distributed

ownership that occurs through online collaboration. Many LMSs are developed and owned by a software company, who in turn charges the educational institution to use the LMS. The institution pays for server hosting and technical support, whether via in internally or outsourced configuration. Instructors design the course space and create course materials, but learners become cocontributors to that space, and may elaborate on course materials. In turn, instructors and peers provide additional shaping to student queries and ideas. In the end, what transpires in an online course space is the interwoven intellectual work of many people and disentangling it in order to reuse or repurpose portions in other contexts may create complex authorship and ownership conflicts.

PRIVACY AND OTHER FORMS OF CLASS DATA

Not all data generated by a class may be considered intellectual property. Personal information is not intellectual property—it is fact, and as such cannot bear a copyright—but people nonetheless have feelings of ownership of this information (see Mai, 2016 for a discussion of different perspectives on personal information as data and the rights of individuals). Personal information privacy rights also vary based on geographic location. The United States and the European Union, for example, define personal information differently. The United States maintains somewhat inconsistent policies, whereas the European Union holds much broader policies protecting the privacy of its citizens (Schwartz & Solove, 2014).

Similarly, clickstream data are not intellectual property, but are rather a factual documentation of a student's online activities. But because these data can "tell the story" of a person's activities in a class space, students may feel as if these data should be considered private. Additionally, students may feel that access and use of these data in a personally identifiable manner (e.g., to check if a student logged in to the LMS on a particular date) constitutes surveillance, and is an unethical practice.

Prior studies have confirmed that students have privacy concerns in online spaces, and will take actions to protect their privacy. For example, students may be reluctant to share or self censor if their privacy needs are not met (Dennen & Burner, 2013; Tang & Lam, 2014; Zdravkova, Ivanović, & Putnik, 2013). In other cases, students may alter their behavior because they believe that course analytic data are being monitored. Specific student privacy concerns vary, and some of the individual factors influencing perceptions of privacy include the intimacy of the information being shared (a subjective and personal judgment), the platform on which the it is being shared, and the manner in which it is being used (Markham, 2012). Although it may seem that today's youth have relatively few privacy concerns and engage in a lot of public self-disclosure in online forums, studies have shown the reality to be more complex, with teenagers negotiating between desires to perform identity and communicate with others online and the personal need for multiple layers of privacy in their lives (Agosto & Abbas, 2015; Livingstone, 2008). In short, it is not safe to assume that students will not have privacy concerns based on content, context, forum, or student age.

Most online classrooms are "semiprivate spaces" (see Elm, 2009, for a discussion of levels of privacy in online spaces) governed by the principle of *reciprocal trust*. Reciprocal trust involves the notion that students may believe that access *is limited to known participants* (e.g., other students registered for the course). Students perceive boundaries even when the classroom walls are virtual, as in the case of an online course. Often these boundaries are reinforced by software-based security, situated in a learning management system, and protected by login systems. By default, students tend to expect these virtual classroom boundaries to be respected by all within and impermeable to those who are outside of class. The only way to breach the privacy provided by these walls, then, is for an insider to share

what happens inside the classroom with others who are not class members.

However, in reality, there may be additional individuals accessing course spaces of whom the students are unaware (e.g., system administrators). These individuals may have legitimate reasons for entering virtual class spaces (in the case of the system administrator, to ensure the technology is functioning properly), although they are not explicitly provided rights to read student messages or review submitted assignments. It would be ethically questionable for such persons to engage in such forms of virtual eavesdropping (Brey, 2006), but it is nonetheless possible. The idea that a class outsider is in one of these semiprivate spaces and has access to student information can be rather unsettling for a student who becomes aware of the possibility. In the author's own teaching experience, there have been instances when technical support staff have entered the class space to assist with a problem. When students saw the new name appearing in the system, they immediately asked about that name, and were concerned about why someone else was in "our" space. Similarly, when teaching an online class about learning analytics, the author was asked by students if they had at some point given approval for their LMS clickstream data to be accessed and used by anyone, perhaps buried in the fine print of a university form. These students also asked who was accessing this information, and what these individuals or entities might be doing with it. Although the author did not—and still does not—know the answer to their questions, it became apparent that once students are aware that these data exist, they are concerned about *how*, and *by whom*, the data are used. These experiences demonstrate that students expect transparency and clarity about the type and nature of any access of their data.

MANAGING INFORMATION ACROSS THE COURSE LIFESPAN

Educational institutions are in the business of sharing and generating knowledge. Typically an institution's intellectual capital is thought of as the knowledge generated by faculty and researchers. However, intellectual capital also is the currency of the classroom, where knowledge may be transmitted to students. In instances where social constructivist learning strategies are used, students may participate in the creation of intellectual capital at the micro level through their learning activities and assessments (Oliver, 2013). Through discursive activities, students may be engaged in the coconstruction of knowledge (Stahl, 2006). As the intellectual capital flows during these activities, new intellectual property may be generated (Oliver, 2013). This section discusses the intellectual property issues that may arise during the three different time periods for a course—before the course begins, while the course is in progress, and after the course concludes—and provides suggestions for ways in which these issues might be planned for and managed by online instructors.

Precourse Issues

Before an online course begins, intellectual property tends to be in the instructor's hands. The instructor likely is the first person to enter into the course space, and the only person who creates and shares anything with others in that space before the course begins. Instructors are likely highly aware of the need to provide appropriate attribution for formally published items that carry a copyright, such as journal articles and videos that serve as course content. They may be less likely, however, to consider rights in two areas: items obtained via nontraditional publishing channels (e.g., images circulated via social media and websites) and instructional materials prepared explicitly in support of pedagogical activities (e.g., syllabi, assignments, and activities), whether instructor-created or adopted or adapted from another source. In instances where instructors have created their own learning materials, they may or may not have placed name on these digital artifacts, declaring authorship to all who may encounter and use them.

The importance of indicating course material authorship depends on the life of those materials, and the instructor-author's concerns about ongoing attribution throughout the materials' life cycle. Students are likely to assume, unless otherwise noted, that course syllabi, lecture notes, and slides are instructor-created. Because these materials are easy to store and share, once outside the course environment proper attribution may only be possible if authorship is clearly noted within the document. While many instructors freely share their course materials with other educators for reuse and repurposing, receiving credit for this work is nonetheless appreciated. Indeed, this very concept of freely shared learning materials is part of the foundation of the open educational resource moment (Wiley & Gurrell, 2009). Instructors may use Creative Commons licenses to retain copyright while specifying the acceptable ways in which their creations may be used by others, including distribution and remixing (Creative Commons, n.d.). They might also share their materials and seek additional teaching materials via OER Commons, a community platform that supports the exchange of open learning materials (OER Commons, 2016). Through this form of sharing with attribution, instructors model appropriate intellectual property practices in a communical work context for their students.

Beginning of a Course

The beginning of a course is the time when an instructor can most easily set the overall tone for the course, which includes specifying expectations regarding student treatment of other people's intellectual property. Often these expectations are articulated in a one-sided manner, focused on how students should respect the intellectual property of individuals outside the course, with a primary focus on avoiding plagiarism of copyrighted texts. Plagiarism of copyrighted text is of great concern in a digital learning context, where copying and pasting another's words can be done with a few simple clicks. Images and other digital media similarly can be copied and repurposed with ease. Education for college students in this area has been decentralized and weak, although across the curriculum instructors expect students to respect copyrights (Rodriguez, Greer, & Shipman, 2014). One study of graduate syllabi showed that only half addressed academic honesty issues (Griffith, Domenech Rodríguez, & Anderson, 2014). What this means is that many people expect proper attribution to be given when intellectual property is referenced, but comparatively few actually take a proactive stance for teaching students about intellectual property, particularly in the digital realm. It is not surprising, then, that students are often confused about expectations and instructors are frustrated that students do not provide attribution as desired.

Focusing on the how students research and integrate existing published work within their course assignments only addresses a portion of the intellectual property concerns within a class setting. Instructors should consider how they expect students to treat the words, images, and other media that are generated and shared by their classmates within the course environment. In disciplinary areas where students are generating ideas that may be salable in other contexts (e.g., business plans, software, creative works), instructors may choose to develop policies, such as a classroom nondisclosure policy. Although there are no legal or professional guides for nondisclosure policies to protect student ideas in a course setting, discussing the concept and setting class expectations can help students better understand appropriate and ethical behavior (Katz et al., 2000; Wright & Katz, 2016).

How students treat each other's words and images is not only an intellectual property concern, but also a privacy issue. If operating within a password-protected learning environment, such as an LMS, students have a reasonable expectation that their posts and the information shared within will not be shifted into another context. Of course, it is possible for class members to copy items or make screen shots, but to do so for any purpose other

than personal learning is unethical behavior. To address this issue, instructors might provide students with reminders about being on both sides of the situation, being mindful of both their own and other peoples' personal information. Additionally, instructors can provide learners with reminders that the course space is not entirely private and thus is not the space to initiate conversations with the instructor about private topics such as grades, health issues, or personal crises.

If the course is using a public learning space or social media tools, the instructor should provide students with a reminder of the public nature of the space. Students may need assistance with navigating public online learning spaces. Although social media may be quite familiar, using these platforms for learning is different from using them to broadcast news or build a network. In particular, students may need help determining what personal information they are comfortable sharing online, how their information will be stored, by whom it might be accessed in the future, and how they wish to have their work attributed to them.

Finally, students should be alerted that clickstream data are collected in the learning environment. Information governance programs, which can cover both privacy and intellectual property concerns as well as how electronic records are stored and retained, may be set at the institutional level (Phillips, 2015), but instructors may wish to further review end user license agreements and investigate what happens to instructional data with an eye toward protecting their rights and rights of their students. Neither instructor nor student may have control over the data being collected, but some portion of these data are typically visible to instructors within an LMS. If instructors plan to access and make use of student clickstream data (e.g., use learning analytics as one form of assessment), students should be made aware of that as well. By being transparent with students that their movement through learning spaces are being tracked, students may feel less invisible in online courses and more aware that if they fail to log in or access learning resources in a timely manner, the instructor may be able to find this information.

Midcourse

In the middle of an online or blended course, student-generated work begins to be shared within an LMS. Student-generated work may range from informal contributions such as posts to a discussion forum to formal, product-oriented ones like completed projects offered up for peer or instructor feedback. At this point in the course, concerns about intellectual property, personal information, or clickstream data are most likely to arise. If the instructor has explained how each is handled in the learning environment, and has specified policies as appropriate to the course content and activities, then the instructor has set forth a clear path for dealing with any confusion or conflicts that arise.

The midpoint of the course is also a period during which an instructor should be actively modeling appropriate means of providing attribution to intellectual property, no matter the context in which the intellectual property is being used. Instructors need to hold themselves to a high standard in this respect. An instructor downloading a graphic file and inserting it into a slide show without attribution, for example, is no different from a student copying and pasting a paragraph of text into a paper without attribution. Instructors need to be sure that all of their instructional materials follow appropriate guidelines for attribution, including forum messages that reference student contributions. When students become accustomed to seeing attribution given everywhere, for all types of intellectual property, in different forms (e.g., a full reference following an accepted style manual format when citing a book in a formal paper and a simple authorship indicator when referring to another student's idea in a discussion post), they will begin to more readily identify intellectual property and value attribution.

End of Course

As noted earlier, an astute instructor may develop and articulate guidelines at the beginning of the course to help students understand expectations about how they should treat both instructor-generated course materials and anything—whether pieces of personal information or more carefully crafted intellectual work—shared by their classmates during the course. Such guidelines can include expectations for accessing, saving, and/or sharing course artifacts once the course has ended.

When digital course artifacts are secured within an LMS, students may have a relatively low level of concern about what happens to their information once the course has ended. In some cases, a student may simply submit the course's final assignment and never again access the course space. However, when course interactions occur in public spaces such as social media, students may have greater concerns about digital footprints. Some of these concerns may have been addressed at the beginning of the course through privacy protection tips (e.g., using pseudonyms, limiting self-disclosure, and selecting tool options that prevent indexing in search engines), but the end of the course is an appropriate time to remind students that once they have received their final grade, so long as they have no grade dispute, they may opt to delete their coursework from public spaces.

Students who have worked in collaborative groups may need to have conversations about how their work products may be shared or used in the future. For example, a student who wishes to include a group project in an online portfolio should consult with teammates before posting that project online. The end of the term is a good point for instructors to encourage groups to hold these conversations and to come to an agreement about what can be shared, how it can be shared, and how attribution will be given to each team member. By making the decisions together, groups can avoid situations in which one member is later surprised (and perhaps upset) to discover the project online while monitoring her digital footprint.

Instructors must also consider how digital course artifacts will be used after the course ends. If an instructor plans to repurpose LMS shells or other learning materials, deleting any student-specific information is an important step to help ensure that student personal information, materials, and assessment data are not mistakenly made available to the next student group taking the course. For example, the author regularly uses a tool called *VoiceThread*, which allows students to make text and video comments on recorded presentations. The author may plan to repurpose student presentations the next time she teaches the course, but will first need to delete comments left by the previous term's students in order to protect their privacy.

If an instructor wishes to use student work as examples in future courses, or to share examples of class activities or tool use with their peers (e.g., when giving a teaching presentation at a workshop or conference), student privacy and ownership must be considered. In these cases, instructors should seek written student permission to use their work in this context and mask their identifying information, as needed. For example, one way to show other people what a discussion forum looks like, rather than logging in and showing the forum as it exists on the server with student names and profile photos in full view, is to use a screen shot and then edit the image to obscure all personal student information. When using past student work examples to give current students ideas, if the student does not want attribution—and often they do not—the student's name should be removed from the paper and also cleared from the document properties. Alternately, if a student has done exemplary work and the instructor wishes to share the artifact more widely at a conference, the instructor should ask the student for permission to share. If the student agrees, the instructor can encourage the student to publish the work online (e.g., post to tools like *Slideshare*, *YouTube*, *flickr*, or *academia.edu*) and

apply a Creative Commons License (Creative Commons [creativecommons.org] is an organization that promotes the sharing of creative and intellectual property in a manner that suits the creator's intellectual property preferences. Creative Commons offers a wide range of license options, which are free and include metadata. These licenses let end-users know whether shared works may be remixed, stored or displayed to others, and used in commercial contexts). This approach makes it possible for the instructor to share the artifact and give appropriate attribution, and it simultaneously affords the student additional control over their own intellectual property. When students are involved in this process, they have yet another opportunity to learn about how to manage privacy and intellectual property rights.

CONCLUSION

The volume of data generated by an instructor and students in an online course is large, and the types of information shared and stored in a class environment are diverse. Learners are likely to have latent expectations about how their and by whom their intellectual property, personal information, and course activity records will be accessed and used. Trust and sharing are intertwined in this context, and both are in the interest of fostering productive teaching and learning exchanges. Keeping these ideals in perspective and maintaining a humble attitude toward the presumed or actual monetary value of shared information in a course environment (rather than focusing on the likelihood that others will cheat or otherwise misuse their contributions) creates an environment that is most conductive to learning (Zwagerman, 2008). Instructors can foster these productive learning environments and help avoid unexpected conflicts or discomfort by developing proactive course policies and helping students better understand their rights and options regarding their intellectual property and their other personal and learning information data that may be shared, stored, and accessed in online course spaces.

Addressing these issues in individual classrooms, however, is not enough. For every online instructor who is highly attuned and responsive to these issues, there are others who are not aware of them. Additionally, online classrooms are not the only ones affected. Many other face-to-face classes in some way make use of digital tools. In practice, that means that most individuals in most contemporary educational contexts are somehow affected by digital data privacy and ownership issues. There are opportunities for leadership in this area, drawing upon the contributions of individual scholars and practitioners, educational institutions, and professional organizations. These leaders can develop detailed, yet highly engaging and readable policies and offer professional development opportunities for both instructors and researchers, all while evangelizing the need action at the course level and better student education in this area. These steps are important for promoting greater awareness of and respect for the array of digital course artifacts and the privacy, ownership, and intellectual property issues related to their storage and use.

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