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# Digital footprints: Creation, implication, and higher education

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## Introduction

Twenty-first century higher education instructors are continually tasked to review, align, pilot, adopt, infuse, and evaluate new technology tools and resources into curricula rich with standards regardless of course format (online/distance, hybrid, and  face-to-face courses). Demands often overwhelm instructors who cannot assume that all students approach technology with the same levels of expertise increases constantly with new multimedia developments. Before courses begin, instructors should pilot these tools and applications to determine accessibility, types of support students may need, as well as determine what types of digital footprints students will leave behind. Digital footprints are unique data trails Internet users leave behind intentionally or unintentionally. Communicating expertise regarding digital footprints is imperative; information shared via the Internet (even when deleted) is never retractable - thus creating implications for students enrolled in school as well as graduates searching for employment.

## Digital footprints: Passive vs. active

Digital footprints can be likened to physical footprints rendered unique to their owners (Dennen, 2015).  Passive digital footprints generate unintentionally.  With the development of online Internet research, as opposed to using a card catalog or a local area network (LAN), search histories and website visits were saved only to the computer's IP address. Now personal computer owners can't use their devices until registering with their name and the IP address.  As a result, connecting to the Internet and visiting websites create a passive digital footprint; the server logs the IP address which denotes the Internet service provider and the location of the computer.  Colleges and universities provide usernames and mandate passwords to track multiple people using the same computer to access the Internet. In this case, the passive digital footprint attaches to both the user and the IP address. Sometimes higher educational institutions, as well as private employers, monitor passive digital footprints to ensure people remain productive while on the Internet instead of surfing the web for personal interests. When anyone is accused of a committing a crime, law enforcement agencies can obtain warrants to confiscate computers and obtain search histories revealing passive digital footprints.

Students in face-to-face courses may be unaware that anytime people go online, they generate digital footprints. Passive digital footprints emerge when signing on to the institution's website for information, performing library research, downloading syllabi because professors no longer supply paper copies, and checking course grades. During the Internet's infancy, unbeknownst to users, search engines and websites created passive digital footprints by downloading cookies. Computers now have settings to block cookies, allow cookies from some websites, or allow all cookies; websites use pop-ups to inform users about downloading cookies regardless of the computer's setting. Although accepting or rejecting cookies has become somewhat of a user's choice, the result is still considered a passive digital footprint because cookies are created by designers to be accepted (or rejected) by users.

Conversely, Internet users generate active digital footprints when they intentionally submit something online. Higher educational institutions require students, staff, faculty, and

administrators to create active digital footprints by using their assigned email addresses for official communication.  Messages can remain online for several years and intuitions and there is no law requiring institutions to disclose this information. Some institutions require online registration, offer book sales online, and bursar's offices accept tuition payments via the Internet.

Course instructors have recognized that teenagers and adults in their twenties have embraced social media as their method, or tool, for communication.  Creating blogs and websites have become common options replacing research papers read only by the instructor. The *APA Style Guide to Electronic References* (2012) contains citation information for documenting entire websites, email messages, online postings, blogs, Twitter updates, Facebook pages or notes, Facebook status updates, and *Wikipedia* entries. When considering applications/tools for online assignments, instructors need to evaluate accessibility in meeting accommodations for students with documented disabilities as well as financial cost. Members of law enforcement, victim's advocates, and lawyers may advise crime victims to maintain a low profile, or no profile, on social media, especially when charges are still pending.  Therefore, instructors should be able to work with these students to design and develop a product graphically similar to those online (McDermott, 2018).

### Implications for online learning environments

Online learning courses and hybrid courses facilitated through learning management systems contain a tremendous amount of data created by both active and passive digital footprints. In online courses, students expect a certain amount of privacy from the instructor and classmates. According to Dennen (2015), many learning management systems are considered semi-private. Discussion board postings, uploaded documents, recorded live class sessions, and emails represent the most common active digital footprints. "The largely unseen data, such as digital records of each user's action on a web site, may be logged in a database without the user's knowledge or awareness" (Dennen, 2015, p. 45). This data can be accessed by support personnel who remain unnoticed to course participants. But what happens to the module when the course is over? Do universities disclose, or have to disclose, how long the data is archived? Is it on the university's server or housed with the LMS provider?  What happens to these modules when a university terminates an agreement from their current LMS provider and contracts another one? The answers to these questions reside in a grey area fluctuating with similar rapidity to development of new technology tools.

### Generating active digital footprints to gain/maintain employment

Research by scholars around the world indicates a growing concern that college students are somewhat incognizant of both the positive and negative implications which arise when employers scour the Internet,  scrutinizing digital footprints of potential hires (Kelly, Christen, & Snyder, 2013; Babić, Krešić, & Kućel, 2014; Pozzi, 2015). A two-year qualitative study conducted by Kelly, Christen, and Snyder (2013) determined whether or not students could think critically in regards to how online reputation (which is generated by active digital footprints) could positively impact employment potential after graduation. During the course of five consecutive semesters, 200 students (between ages 18-24) analyzed the online presence of their classmates on four social media sites: Twitter, Facebook, LinkedIn, and Pinterest during a course activity.  The participants were enrolled in business communication courses and computer-mediated communications courses at two universities in the same state (within the U.S.). Some of the courses met face-to-face and some were online. Results indicated students knew how to

use privacy settings to conceal information and when information should be deleted.  However, participants were not aware they were setting their privacy levels so high that they missed opportunities to self-promote their professional presence. Kelly, Christen, and Snyder (2013) concluded that in order "To adapt the changing landscape of the job market, instructors must concentrate on presenting a balanced view of social networking, focusing equally on what information students should provide as well as that which they should not" (p. 32).

Similar conclusions have been drawn from research outside the United States. In 2014, Babić, Krešić, and Kućel surveyed 175 students (between ages 18-23) in a traditional face-to-face classrooms studying at Polytechnic of Rijeka (in Rijeka, Croatia) to determine their levels of awareness regarding online reputation management and the importance of digital identity in education. Participants were full-time student in their freshman year enrolled in courses for information science (31%), entrepreneurship (21%), and transportation management (47%). Before taking the 19-question opinion poll, participants had already completed a project in an online learning activity.  Results indicated that students were aware they needed to develop online responsibility, as well as how they contribute to other people's digital identities when they post comments or "like" postings, photos, etc.  Results also indicated student awareness of creating separate professional and personal identities on one platform - one dedicated to a public, professional identity and the other designated for friends and family with high privacy settings.

According to Pozzi (2015), most higher education institutions maintain a corporate presence on social media websites although they provide little in the way of formal training for students. "While environmental scan revealed a dearth of resources targeting undergraduates, there was a plethora of high quality, visually appealing and content-rich online material available for school-aged children" (p. 2).  Pozzi, based at the Queensland University of Technology (in Brisbane, Australia), also noted that most universities assigned social media skills within information literacy in the library and in career modules. Key topics generally included cyberbullying and online security as opposed to professional, responsible, and strategic use of social media. From these findings emerged an initiative from the QUT Library called "Create a Better Online You" (CBOY) which "represents one of the first free, openly accessible, interview resources targeting the social media skills of undergraduates" (p. 1). CBOY was slated to be piloted with a freshmen education unit examining how teachers establish a professional online reputation.

### Conclusion

Nathan, MacGougan, and Shaffer (2014) advocate educational institutions claim responsibility for developing and maintaining proactive policies regarding the ethical use of social media platforms in the classroom by creating committees comprised of necessary stakeholders including instructors, students, and administrators.  Although their findings were based on research with iSchools educating K-12 students, this pedagogical model appears replicable at post-secondary institutions.  Most compellingly, Lowenthal, Dunlap, and Stitson (2016) assert that if an instructor intends for his or her students to demonstrate online responsibility, the instructor should first create and/or maintain a professional online presence for students to view and model. Lowenthal, Dunlap, and Stitson (2016) also advocate for the development of unique "educational technology professionals" whose capacity for digital literacy and digital fluency will aid already overwhelmed instructors and their students to create these online web presences. However, the "presence" itself should not be the primary focus of

instruction. Educational technology professionals must equip constituents with information about the development process which involves evaluating active and passive digital footprints. People who lack this knowledge may generate digital footprints with negative implications thus necessitating remediation. But this process needs to be reversed; people should receive education enabling them to create and strategically implant positive, active digital footprints on the Information Superhighway.

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