The Role of Social Media in Dental Education

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Abstract: Social media, also known as Web 2.0, includes a set of web-based technologies in which users actively share and create content through open collaboration. The current students in dental school are Millennial learners who are comfortable using social media, such as Facebook and Twitter, for both socialization and learning. This article defines and explores the range of Web 2.0 technologies available for use in dental education, addresses their underlying pedagogy, and discusses potential problems and barriers to their implementation.

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Technology is revolutionizing dental education. Students can now access vast quantities of information from a variety of sources at their own convenience and from virtually any location. By utilizing DVDs containing hundreds of textbooks and websites with interactive video tutorials, today’s dental student can learn in a way tailored to his or her individual learning style. However, this personalization does not mean that dental students prefer to learn alone. On the contrary, most dental students of the Millennial generation—those born after 1982—value collaborative learning, team-based projects, and social networking. They see their peers as an important learning resource. Millennials are able to stay connected to their peers via handheld devices with wireless capabilities. This shift away from the individual learner to communities of practice is supported by social learning theories that extol collaborative education. Communities of practice are defined as “groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.”

Social media, or Web 2.0 technologies, initially provided a means for socialization but are increasingly used for educational purposes. Recent studies have found that incorporating social media tools into traditional educational environments increases student learning and collaboration. The evolution of web-based communities for learning has four key advantages: 1) it enables collaboration among different users, 2) it allows users to create personal content through different forms of media, 3) it permits users to publish individual works, and 4) it creates new approaches to research. This article defines and explores the range of Web 2.0 technologies available, addresses their underlying pedagogies, and discusses potential problems and barriers to their implementation in dental education.

Web 2.0 Defined

In 1989, access to information changed dramatically with the invention of the World Wide Web. The initial launch of the Internet, with relatively few “content creators,” can be classified as Web 1.0. Conversely, Web 2.0 websites depend on the collaborative work of many content creators. Web 2.0 includes social media such as Facebook and Twitter, video sharing such as YouTube, and interactive websites, such as blogs and wikis. Virtual environments, such as Second Life, are also considered social media because they enhance communication and learning through the use of simulated experiences and role playing via avatars (Figure 1). This exchange of information among larger groups of individuals not
only fosters camaraderie but also creates a “platform for participation.” In the context of educational applications, Web 2.0 technologies incorporate a “strong social component while ... encouraging user-generated content in the form of text, video, and photo postings along with comments, tags, and ratings.” Therefore, Web 2.0 can be utilized to promote unique learning platforms based on communication and the development and sharing of content.

Although Web 2.0 is a relatively recent phenomenon, due to technological advances it is changing and improving at an accelerated rate. As such, no “media natives” exist, so even the most technologically savvy need to constantly refresh their web capabilities. Likewise, scientific knowledge in dentistry is currently doubling every five years. Web 2.0 technologies offer solutions to staying current with this dramatic increase in information. Encouraging dental faculty to harness the potential and reach of Web 2.0 is especially important, as an evidence-based approach to patient care is being advocated. Therefore, dental students need to know how to find, sort, analyze, share, discuss, critique, and create information with their peers. Furthermore, the predilection of dental students to form groups for social and learning purposes supports their transition into the culture of the dental profession.

**Facebook**

Facebook is a social networking website where over 750 million individuals share photos, videos, and commentary. This website, initially designed for college students, is open to everyone, with half of all subscribers logging on once a day. Facebook provides privacy settings to prevent the general public from viewing members’ personal information. One must accept another’s “friend request” in order to permit access to one’s “profile.” Profiles contain information such as birthdates, relationship statuses, and interests. Facebook “friends” can upload videos and photos and “tag” others (placing a virtual nametag on the person in the photo or video). Facebook friends can write on each others’ “walls” (virtual notepads where friends exchange messages that are visible to others). Private e-mails can also be sent via this site. Facebook encourages subscribers to create groups and events to which they can invite others. This ability to communicate seamlessly has transformed Facebook into a powerful virtual community with endless possibilities.

**Figure 1. The social learning environment of Web 2.0**

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However, its application for educational purposes is largely unexplored by teachers.

In 2008, Salaway et al. found that 49.7 percent of students were communicating with their classmates regarding their coursework over social networking sites. This high percentage prompted Gray et al. to conduct a survey of Facebook’s use among medical students and to explore ways Facebook could be leveraged for educational purposes. Their findings indicated that many students turned to Facebook instead of university online learning sites in order to organize and participate in study groups. According to Sweet et al., dental students have utilized Facebook applications to prepare each other for objective structured clinical examinations (OSCEs). Because there is often limited oversight or advisement in these informal online study groups, Gray et al. suggested that instructors oversee and manage these groups. However, the researchers also found that some students wished Facebook to remain a separate study space inaccessible to academic staff. These students prefer to keep their Facebook profiles private and do not wish to be pressured to “friend” their professors.

Twitter

Twitter, a social networking site started in 2006, allows subscribers to send “tweets,” short messages of no more than 140 characters, to their followers. Also known as microblogs, tweets run the gamut from breakfast choices to comments on current events. Twitter is slowly being incorporated into higher education, allowing for more real-time dialogue among students and professors. Professor Camplese, a professor of educational technology at Penn State, operates two screens during lecture: one for his slides and the other for a Twitter feed of student commentary and relevant links. In this way, students play a more active role by contributing to the curriculum and, in the process, constructing their own knowledge. Hence, the traditional lecture format is being transformed into a more social, student-oriented, expansive experience.

Concerns about Twitter having a distracting effect on academic performance appear to be unfounded. A randomized control trial was recently conducted comparing the performance of pre-health professions students in classes where Twitter was integrated versus the performance of those in classes where it was not. The researchers found that the engagement level and semester grades of the experimental Twitter group were significantly higher than those of the control. George and Dellasega found that the incorporation of Twitter led to more succinct yet substantive communications in a writing course for medical students, a valuable skill for future doctors who will be expected to communicate effectively with patients, peers, and other health care professionals.

Wikis

Wikis are websites created, edited, and developed by a community of individuals. Wikis thrive on contributor activity: contributors post external links, make references, or delete erroneous information. The best-known example of a wiki is Wikipedia, the free online encyclopedia. Many worry about the accuracy of Wikipedia, which hinders the use of this website as a reference for, say, a peer-reviewed publication. However, the large number of web surfers who read and edit Wikipedia results in a pool of information that includes much accurate information. In fact, a study found that Wikipedia contained roughly the same number of errors as Britannica, a traditional encyclopedia.

Wikis can provide students with a forum for collaboratively creating, discussing, and editing articles on specific topics related to their classes. Student contributions give teachers valuable information, such as which topics need clarification or additional explanation. Wikis could also serve as a means to teach students how to assess the accuracy of information found on the Internet before contributing. However, due to its collaborative nature, it may be difficult for faculty members to grade wiki contributions.

Curricular reform in medical and dental education seeks greater integration of the basic and clinical sciences. Philips et al. incorporated MediaWiki into an integrated gross anatomy course at Mayo Medical School. Students were asked to work in small groups to create a patient case based on a given diagnosis. They were given weekly feedback on their wiki contributions. This collaborative approach to learning allowed students to correlate anatomy to clinical diagnosis during their preclinical years.

Blogs

Blogs are web-based journals containing user posts (observations, opinions, photos, videos, etc., often with links to other sites) in reverse chronological
order. Created on free platforms such as Wordpress, blogs are dependent on the persistence and interest of the author(s) and encourage commentary from readers. Some blogs maintain a consistent theme in all of their entries, while others vary. When a blog is concerned with a particular topic and is targeted toward a specific audience, viewers can discuss the topic in depth and learn from each other. In addition, blogs have been found to encourage reflective learning. El Tantawi found that dental students who posted on course blogs performed better on examinations than those who did not. However, those who posted less often performed better than those who posted more. The disadvantages of blogs include the sometimes questionable credibility of the information posted and the fact that some students mistake opinion pieces for factual articles. In addition, Crook et al. found that many educators viewed blogs as merely personal diaries and largely ignored their educational potential.

**Vlogs**

Vlogs, or “video blogs,” are video recordings that are generally single-authored. Vlogs have the same potential disadvantages as blogs due to their possible lack of credibility and reliability. Vlogs should not be confused with video recordings of lectures or vodcasts. Vlogs and blogs are meant to be informative and interesting but relatively short. Their main educational purposes are to encourage reflection and to spark discussion so peers can learn from each other.

**YouTube**

YouTube is a Web 2.0 website, founded in 1997, where members upload and share videos. These videos range from formal lectures to homemade skits. Students and teachers alike can post videos, tutorials, and vlogs. YouTube videos can provide students with information on a slew of topics. For example, Linh Phan, a New York University College of Dentistry student, operates a channel on YouTube where she posts vlogs that provide viewers with her perspectives on dental school life. Linh also posts tutorials, such as her five-part tutorial on creating interim restorations. Also posted on her channel are commentaries from dental students around the world who pose questions, offer possible alternatives, or express appreciation of her efforts. Instead of showing a static series of slides, faculty members could incorporate YouTube videos of procedures into their lectures, thereby creating a more multimedia user-friendly experience.

**Second Life**

Virtual worlds, such as Second Life, are enriched 3D environments designed for both social and educational purposes. Dental educators could create scenarios to allow students to interact with nervous, angry, or special needs “virtual” patients in an engaging, simulated environment. In addition, giving students multiple opportunities to diagnose, treatment plan, assess caries risk, conduct tobacco cessation counseling, etc. would serve to reduce their anxiety and enhance their confidence before they treat real patients.

**Elgg**

Elgg is an open source social networking platform designed primarily for educational applications that combines multiple Web 2.0 technologies: blogs, wikis, filesharing, networking, etc. Subscribers can create and join groups, connect with friends, and display a profile, blog, and microblog. In addition, they can add webpages, upload presentations, documents, and multimedia files and tag these pages. Each item can be assigned its own access restrictions, so students can choose to make it available to all Elgg members or to limit access to a specific person or group. Therefore, Elgg supports both formal and informal peer sharing and discussion. Its versatility improves upon traditional learning management systems, making Elgg a beneficial platform for learning and collaboration. Elgg was used successfully by the NOVICE project, a collaboration of veterinary schools in twenty-eight countries, in which wikis, blogs, and other social media were utilized to promote the exchange and access of information.

**RSS Feeds**

RSS feeds are convenient time-saving ways to access newly published information from favored websites. Instead of “pulling” information from multiple websites, updated information, such as blog entries, news headlines, etc., can be “pushed” continuously to the user. Examples of RSS feeds for dental professionals include the dental section of MDLinx and, for patients, knowyourteeth.com from the Academy of General Dentistry. Since most academic journals provide access to RSS feeds to subscribers, faculty members could encourage
students to subscribe to these feeds or alert students when pertinent information becomes available.

**Mashups**

RSS technology allows students to create “mashups” by combining and remixing information resources, such as mixed media, content, web applications, and services, sometimes for purposes that were usually not intended by the original creators. According to Skiba, mashups can be employed creatively to combine medical data sources with visual aids to enhance learning.

Yahoo! Pipes is a social networking platform based on RSS capabilities that gives its members the tools to manipulate and remix content and data from around the web. Pipes can pull information from multiple websites or search engines simultaneously. With Pipes’s drag and drop feature, members can filter search results or RSS feeds, thereby creating a “pipe.” Pipes can be saved and published, allowing other Yahoo! Pipes members to search for and copy the pipe. Yahoo! Pipes is accessible to the public. However, only Pipes members can view each other’s sources. This limited exposure of sources leads to concerns regarding accuracy. Even so, this Internet platform can be beneficial to students and academics alike by allowing the sharing of research results.

**Social Bookmarking**

Social bookmarking is a method of organizing, saving, searching, and sharing bookmarks of web pages found online. Unlike file sharing, the resources themselves are not shared, only the referenced bookmarks. Examples of social bookmarking sites for academic papers are delicious and citeulike. For example, when a professor or student finds a website to bookmark, he or she right-clicks the site to add it to his or her account and “tags” it with a few relevant keywords. Since the list is public, he or she can easily direct peers and students to it. Bookmarked sites also indicate who else bookmarked the site. Another click shows the bookmark collections of others interested in the same site. Social bookmarking simplifies the distribution and sharing of reference lists, bibliographies, and other resources among educators and students, thereby fostering academic collaboration.

**Crowdsourcing and Apomediation**

Crowdsourcing, a term coined by Howe in 2006 from the words “crowd” and “outsourcing,” relies on the collaboration of a large group in order to find a solution to a problem. For example, Yahoo! Answers is a webpage where readers post questions and rely on others to respond anonymously. Answers are voted up or down; hence, responses gain or lose credibility in the process. Another example is Digg, a virtual warehouse for articles, videos, etc. taken from other websites. Digg allows subscribers to vote stories up or down. When enough readers vote items up, the articles are featured more prominently on the website and, in turn, gain recognition and more credibility. Items that are voted down eventually get removed from the website. Digg’s voting process, somewhat comparable to Yelp’s user ratings of various businesses, displays the growing influence of third-party reviews.

Crowdsourcing may be best integrated into courses in which specific problems need to be solved. Instructors could pose a problem or question and expect students to brainstorm and reach a solution collaboratively. Apomediation is a form of crowdsourcing in which information is “apomediated” by peers versus that which is “intermediated” by authorities and experts for the sake of laypersons. An example is the site PatientsLikeMe, in which medical information and opinions are shared by patients and other interested individuals.

**Discussion**

Web 2.0 technologies can help provide enriched and diverse active learning environments that are student-centered as well as collaborative. However, a significant generation gap is impeding the incorporation of many Web 2.0 technologies into dental courses. Compared to their mostly Baby Boomer faculty members, Millennials are far more likely to have their own social networking profile (75 percent vs. 30 percent for boomers), ten times more likely to have posted videos of themselves online, and send twice as many texts (twenty) every day. Many faculty members do not feel technologically proficient enough and are concerned with the amount of time needed to become so. Moreover, others fear that students will no longer attend their lectures. However, a recent study found that 90 percent of students said that adding e-learning methods did not have any effect on whether or not they attended lectures. In fact, incorporating these technologies could increase student engagement. El Tantawi found that 60 percent of students and 80 percent of non-native speakers...
of English were more comfortable writing posts or comments than speaking in class.23,45

Among Web 2.0’s many advantages is its remarkable ability to link diverse and geographically dispersed groups of students. For example, Diaste-mas.net is a consortium of six dental schools from around the globe that hosts student blogs. Students share portfolios, personal reflections, and links and post feedback and suggestions to each other, fostering a real, if virtual, sense of fraternity.46,47 In addition, the average U.S. dental student is spending a greater percentage of his or her dental education (on average six weeks) providing care at community locations. Web 2.0 technologies allow students and faculty at the community sites to stay in touch with their peers and institutions and to access coursework.48-50 Moreover, five of the new dental schools (East Carolina University, Lake Erie College in Florida, Midwestern University in Illinois, University of New England, and Western University in California) are founded on the community-based education model, in which students are expected to spend significant clinic time offsite helping to improve access to care.51

Web 2.0’s capacity to connect people in different locations might also help address the severe shortage of full-time faculty members in dental education. According to Vanchit et al., the current shortage of 400 U.S. dental educators is projected to skyrocket to 900 by 2020 because additional dental schools are expected to open, aging faculty members are likely to retire, and few students are interested in pursuing academic careers.52 Web 2.0 can help ameliorate this situation by providing students and faculty members located at remote sites access to instructors and course materials. Dental professionals and faculty members could also employ social media to locate experts to solve specific patient problems and find collaborators, thereby extending their respective professional networks.

The limitations of Web 2.0 technologies include the risk of inappropriate and unprofessional online behaviors, especially if student anonymity is preserved.53 Sixty percent of U.S. medical school deans have reported incidents of students posting unprofessional content online, and 13 percent admitted to patient privacy violations.54 The uploading of patient clinical data, such as radiographs and photographs, to social media sites could violate the Health Insurance Portability and Accountability Act (HIPAA) of 1996 that protects patients’ privacy and personal medical information.55,56 Therefore, policies on social media usage need to be written explicitly so that appropriate standards of conduct and professionalism are maintained.55

To ensure that high-quality course materials and other information are distributed, faculty members will need to maintain some control of site content so they can delete dated materials or those of dubious quality. Students need to be aware of copyright restrictions that may not permit the dissemination of certain materials. Notably, the same copyright protections exist for the author of a work regardless of whether the work is in print, in a library database, on a blog, on an online discussion board, or in any social media format.57 When in doubt, students should be encouraged to seek approval from the copyright owner prior to using materials, including the intellectual property of their professors.

Dental faculty members need time to learn how to incorporate social media and other forms of e-learning into existing curricula and to respond to individual student posts and contributions. Similar to learning a foreign language, mastery of Web 2.0 technologies requires repeated practice. While many of the applications discussed above are free of charge, equipment is needed to run and maintain such technologies. For example, in Campese’s classroom, two screens are needed to view the active Twitter streams that enable real-time student participation.57 Each student needs a laptop or a smartphone with wireless capabilities. Technical support people need to be hired not only to train faculty members and students but also to keep their devices in working order.

**Conclusions**

Rapid increases in dental knowledge and associated technologies, growing integration of evidence-based practice into the curriculum, and shifting faculty roles (from lecturers and content experts to facilitators) have profoundly altered dental education. New Web 2.0 technologies and e-learning promise exciting opportunities for collaboration and knowledge creation. Because social media in dental education is still in its infancy, research should be undertaken to determine optimal ways for incorporating these technologies into both traditional and e-learning courses. Barriers to their adoption include cost, faculty, student, and institutional resistance, patient privacy issues, and content quality concerns. Even though these impediments are significant, the potential for deeper learning and student engagement resulting from the incorporation of social media into...
dental courses appears to be worth the significant investments of time and money.

REFERENCES


33. Lamb B. Dr. mashup; or, why educators should learn to stop worrying and love the remix. Educause Rev Online 2007;42(4):12–25.


