

Web 2.0 Technologies: Facilitating Interaction in an Online Human Services Counseling Skills Course

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In the face-to-face classroom, human services counseling educators rely on highly interpersonal, interactive methods to teach clinical skills. Replicating these instructional methods in the asynchronous, text-based e-learning environment has been difficult and sometimes impossible. However, web-based technologies, specifically Web 2.0 technologies, may afford educators the opportunity to simulate and enhance the strengths of highly interpersonal and interactive methods of face-to-face clinical skill instruction. These authors demonstrate how a human services counseling skills course can be taught using Web 2.0 technologies. Most of the focus will be on two synchronous applications: 3-D virtual worlds and web conferencing. Implications for educators and recommendations for future research are provided.

KEYWORDS *counseling skills, e-conferencing, e-learning, 3-D virtual worlds, Web 2.0*

A counseling skills course that is aimed at students' acquisition of essential interviewing and clinical skills is a core component of a human services counseling (HSC) program (Council for Accreditation of Counseling and

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Related Educational Programs, 2009). The micro and macro skills learned in a core skills course are foundational to the counseling profession and include, but are not limited to, (a) attending behaviors and listening skills; (b) observing and reflecting feeling; (c) using questions; (d) employing advanced empathy and affirming strengths; (e) practicing exploration skills, immediacy, and confrontation; (f) using change strategies and goal setting; (g) conducting an initial interview; and (h) learning crisis intervention and prevention techniques (Ivey & Ivey, 2007). Traditionally, HSC programs have relied on face-to-face (F2F) interactions to teach these micro and macro skills. Simulated counseling sessions, role-plays, and live supervision have been integral components to this training. With the rapid growth of online education and the increasing number of students choosing to participate in courses via the Internet as opposed to the traditional classes (Lee & Nguyen, 2007), it has become incumbent on HSC educators consider the online medium for the delivery of skills courses.

To date, the appropriateness of the online delivery medium for HSC training, especially skills training, is debated. Some HSC educators have argued that the e-learning environment does not facilitate the highly interpersonal interaction needed to teach clinical skills (Granello, 2000; Greenidge & Daire, 2005; Patrick, 2004). Consequently, "...programs that educate counselors, human service professionals, and social workers lag behind other professions in utilizing new technologies in online education programs" (Karper, Robinson, & Casado-Kehoe, 2005) and lag behind other professions in the adoption of online education. Despite the overall lag in the helping disciplines, several HCS programs have taken advantage of the latest technologies available to deliver pedagogically sound and quality online courses. They are meeting the needs and demands of students for online courses by providing courses and complete programs via the Internet and providing the synchronous and asynchronous interpersonal interaction needed to teach skills courses (Regan & Youn, 2008; University of Michigan, 2004; Casey, Bloom, & Moan 1994; Collins & Jerry, 2005; Payne, West, Rockinson-Szapkiw, & Castellanos, 2007; Regan & Youn, 2008; University of Michigan, 2004; Watson, 2003; Walker, 2009a). Counseling sessions, role-plays, and live supervision that have been an integral components of traditional skills training are being simulated in the online environment using Web 2.0 technologies.

Web 2.0 refers to the second generation of the Internet that utilizes the Web as a *platform* to facilitate collective intelligence, contribution, and collaboration (O'Reilly, 2005), and it is defined by its technological components, including content management systems (CMS), podcasts, vodcasts, 3-D virtual worlds and simulations, collaborative conferencing software, blogs, and wikis (see Table 1 for an overview of each of these technologies). Web 2.0 technologies provide users with an opportunity to interact online both synchronously (real-time) and asynchronously (different time) via text, audio, video, and graphics. Although challenges exist, which will be mentioned briefly, Web 2.0 technologies may simulate, enhance, or perhaps

TABLE 1 Description of Web 2.0 Technologies

Technology	Definition	Selected key features	Usage	Examples
Course Management System (CMS)	Computer software developed for the creation, organization, managing, and publishing/delivery of course content	Automated templates Document and workflow management Grade book Discussion forums Homepages	Material delivery Course organization Threaded discussions Assignment submission Assessments Grading Class roster Track participation	Blackboard www.Blackboard.com eCollege www.ecollege.com Angel Learning www.angellearning.com Moodle http://moodle.org Sakai http://sakaiproject.org MIT OpenCourse ware http://ocw.mit.edu openourse CMS www.opensourcecms.com Webex http://meetmenow.webex.com Go To Meeting https://www1.gotomeeting.com Skype www.skype.com Elluminate Live www.illuminate.com/products.jsp Horizon Wimba www.wimba.com/ Adobe Connect http://adobe.com Gabcast, a podcasting and audioblogging platform that enables users to create, store, and distribute audio content www.gabcast.com Audacity, open source audio recording and editing program http://audacity.
Web Conferencing Systems or e-conferencing systems	Software that enables users in different geographical locations, connected to the Internet, to see the same screen and interact in real time.	VoIP (voice-over IP) Full-motion video Text chat Live, desktop-to-desktop-video Whiteboard File transfer Breakout sessions Application sharing Recording and repurposing of session in compressed files	Interactive discussions Multimedia presentations Audio and video group work and supervision	
Podcasts and Vodcasts	Podcasting is the process of capturing audio and posting the audio file to a website. Vodcasting is podcasting with the addition of video.	Portable audio/video file Anytime/anywhere access	Lectures Interviews with guest speakers/experts Present case study in dramatic form Exam review Course Announcements	

(Continued)

TABLE 1 Continued

Technology	Definition	Selected key features	Usage	Examples
3-D Virtual worlds	Simulations are real-life systems or processes that are re-created in a smaller or more abstract form.	Multiple users Rich image Persistent environment Immersive Public access Private ownership of land and objects Wide Area Network access Collaborative relationship	Role-play Practice decision making real-time practice business ventures Simulate real classroom Experience DSM diagnosis (e.g., Yellowless's Virtual Psychiatric Ward)	sourceforge.net Switchpod.com www.switchpod.com Apple's iTunes www.apple.com Note: Podcasts and vodcasts can be hosted on CMC s Second Life http://secondlife.com Active Worlds Educational Universe (AWEDU)www.activeworlds.com Project Wonderland https://lg3d-wonderland.dev.java.net/ Educational Bloggers Network www.ebn.weblogger.com Edublogs www.edublogs.org Weblog-Ed www.weblogg-ed.com WordPress http://wordpress.com Wikipedia www.wikipedia.org PB Wiki http://pbwiki.com Wiki spaces www.wikispaces.com Wikibooks http://en.wikibooks.org
Blogs	Customized web pages in which entries are logged in a chronologically reversed order	WYSIWYG editor (what you see is what you get) Syndication	Self-reflective journaling Learning portfolio	
Wikis	A website in which any individual can add and edit information without administrative access rights	Collaborative page editing Document management File Sharing WYSIWYG editor Syndication	Postcourse content Share collaborative knowledge	

surpass the strengths inherent in the traditional F2F HSC skills instruction. To demonstrate, these authors explain how HSC educators can adopt one or more Web 2.0 technologies to pedagogically support teaching skills online. These authors explain how they are using a combination of some of the most popular Web 2.0 technologies to teach undergraduate and graduate skills courses: (a) a content management system for the organization and distribution of the course material; (b) a 3-D virtual world or multiuser virtual environment (MUVE) for class lectures, demonstrations, and role-plays (c) a conferencing system for small group skill practice, group discussions, and live supervision; (d) podcasts and vodcasts for counseling skill demonstrations and interviews with field experts; (e) weblogs for self-reflection, learning portfolios, and feedback from other students and educators; and (f) a wiki for resource sharing. This discussion will focus most extensively on the key features and use of the two synchronous applications: 3-D virtual worlds and web conferencing. Other technologies will be mentioned briefly to demonstrate how they can be integrated into and enhance the course. Implications for practice and direction for future research will ensue.

WEB 2.0 TECHNOLOGIES IN A COUNSELING SKILLS COURSE

Course Management Systems

Course management systems (CMS), such as Blackboard, Angel Learning, and Moodle, are computer software programs that facilitate the delivery of online training and dissemination of course content (Comeaux & McKenna-Byngton, 2003) and are the most commonly used technology in the online higher education environment. At the beginning of the semester, students enrolled in the HSC skills course use their usernames and passwords to log into the CMS. For the purpose of this discussion, one of the most popular open source CMSs, Moodle, is used. The CMS is the place that the course is housed; students find the course welcome, syllabus, course schedule, modules, assignments, learning materials, and links to the various technologies employed in the course. Throughout the semester, students are encouraged to log into the CMS twice a week to review weekly modules, submit assignments, check their grades, read announcements, and track scheduled learning events. The CMS is useful in providing organization to the course and is the primary method of student interaction with course content. Additional Web 2.0 technologies facilitate asynchronous and synchronous interaction among the students, the educator, and the content.

Podcasts and Vodcasts

Podcasts and vodcasts enable delivery of content to students in the form of both audio and video. Derived from Apple's iPod and broadcasting network,

podcasting is “[t]he process of capturing an audio event, song, speech, or mix of sounds and then posting that digital sound object to a Web site or a blog” (Meng, 2005, p. 1). Vodcasting (video-on-demand) is essentially podcasting with the addition of video. For the skills course, the educator, with the support of an instructional designer and instructional technologist, creates audio and video files of counseling session demonstrations, dramatized case studies, and interviews with experts. Proficient in audio editing, the educator records and edits the audio files using the free open source recording and editing software Audacity, and the educator uses the support of the university teaching and learning center to create and edit educator-scripted videos. Audio files in mp3 format and video files in various formats are posted on a podcasting/vodcasting platform for storage and student access (e.g., iTunesU). Students log into the platform and download the files on their desktops and portable devices for the purpose of learning new skills and techniques; dramatized case studies are used for small group discussions. The inclusion of podcasts and vodcasts in the course promotes students’ engagement with the content and is extremely helpful for auditory and visual students. Additionally, inclusion of these technologies as well as the weblog and wikis, which will be discussed next, may serve to increase students’ sense of teaching presence and social presence (Seitzinger, 2006).

Weblogs and Wikis

Weblogs, or blogs, are easy-to-use customized web pages in which entries are logged in a chronologically reversed order (Herring, Scheidt, Bonus, & Wright, 2004). Blogs are personal pages, whereas wikis are communally created. A wiki is a website in which any individual can add and edit information without administrative access rights. The most popular example is Wikipedia.

During the first week of the course, students create their own personalized blogs and use an aggregator to link them to a course blog created by the educator. Blogs are used first for an introductory activity that provides students the opportunity to get to know one another. Students are encouraged to post their pictures, autobiographies, and their “favorites” (e.g., ice cream, books, links, etc.) to their blogs. This introductory activity establishes a culture of interaction that helps the course run smoothly (Conrad & Donaldson, 2004). Students also use their blogs throughout the course for reflection on and demonstration of their learning (see Figure 1). During each module, students visit their blogs to post learning reflections that are guided by the questions provided in the assignment section of the CMS. They also upload documents created in the course that demonstrate their learning accomplishments. This self-publishing aspect of the blog encourages students’ ownership and responsibility for their learning and increases writing skills and reflective learning (Godwin-Jones, 2003). When students visit

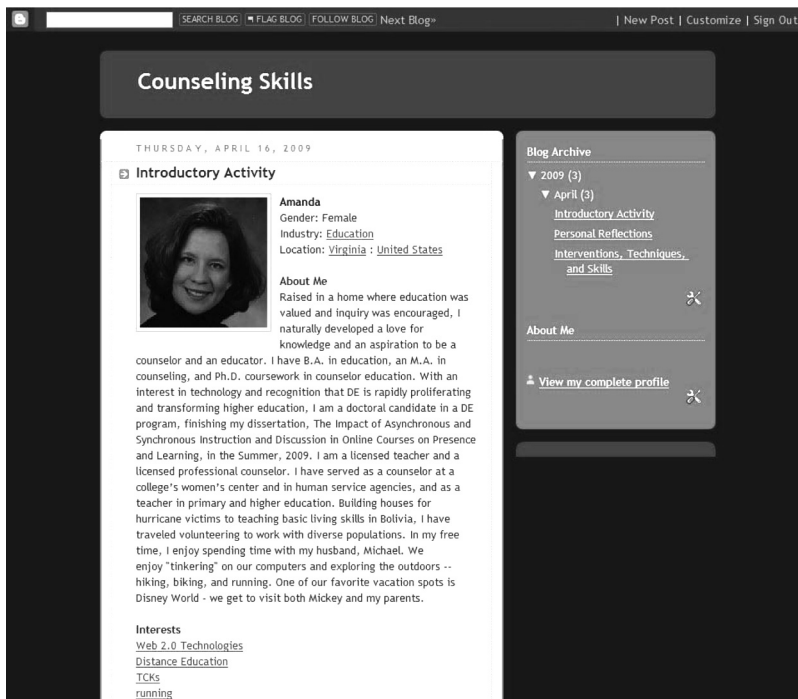


FIGURE 1 Example of a blog.

one another's blogs to provide feedback and encouragement (note: students were required to visit at least three peer blogs per module), students establish a sense of community, diminish feelings of isolation often felt in online courses, and challenge one another to critically think (Armstrong & Retterer, 2004; Dickey, 2004; Rourke & Anderson, 2002).

Students also visit a class wiki throughout the semester to share annotated bibliographies of course-related websites and articles. Students post at least the five required annotated bibliographies throughout the semester. Thus, the blogs and wikis provide students with the opportunity to collaborate, to socially construct knowledge, and to establish connections and intimacy similar to those experienced in a traditional classroom (Dickey, 2004; Godwin-Jones, 2003; Poling, 2005; Ray, 2006; Rourke & Anderson, 2002). Further social connections and construction of knowledge, similar to a traditional classroom, occur through interaction with the synchronous Web 2.0 technologies employed in the course.

Multuser Virtual Environment (MUVE)

A MUVE transforms the two dimensional e-learning platform into a three dimensional virtual learning environment and facilitates asynchronous and

synchronous interaction among the students and the educator. For the purpose of this discussion, one of the most popular MUVES, Second Life (SL), is utilized.

Prior to the first synchronous class held in SL, students download the SL software and attend two one-hour instructional sessions with the educator and instructional technologist. One is held via online videoconferencing to demonstrate the SL environment and one is held in the SL environment. In the SL environment, students create avatars—graphical representations of their person—to navigate the 3-D virtual environment. Students learn to control their avatar by using a mouse, keyboard, headset, and learn how their avatar can simulate almost any communication or action that is possible in the real world (Educause Learning Initiative, 2006). Hardware is tested, and technical troubleshooting is completed. These instructional sessions help to avoid technological and new user problems during class time, thus class time can be used for educationally meaningful purposes. Students who require additional instruction download video tutorials created by the educator and instructional designer to assist with downloading, installing, and using the SL software.

For each scheduled synchronous class meeting, students log into a customized area of SL that was created for the HSC program by the educator and instructional designer. The customized area is complete with a classroom building that houses classrooms and counseling labs with one-way mirrors (see Figure 2). The avatars commence in a virtual classroom. Meeting in this 3-D virtual environment, students are provided with a sense of peer and teacher presence that simulates a traditional classroom.

As students enter one of the counseling building classrooms in the form of their avatars, the educator in avatar form verbally greets each student using the voice tool, a tool that allows the educator's voice to be transmitted over the Internet. To commence the class, the educator's avatar moves to the front



FIGURE 2 Counseling lab in second life.

of the room and gains everyone's attention by using the voice tool and saying, "Let's get started. Please be seated."

As he or she would in a traditional classroom, the educator begins the SL synchronous class with class objectives and a mini lecture on the target skills (e.g., observing client's nonverbals and deescalating angry clients). During the lecture, the educator can see all of the students' avatars and knows that a raised hand indicates a question or a comment. The students and educator use the voice and chat tool for discussion, questions, and comments.

Role-plays to practice the targeted skill(s) follow the lecture. The educator begins the role-play practice by modeling the skill of observing nonverbals. He or she asks for a student volunteer to assist by playing the client. The educator and the student avatar sit in the front of the classroom for this demonstration. The role play goes as follows:

- Educator/counselor (avatar takes an open stance): What brings you here today?
- Student/client: My parents are pressuring me.
- Educator/counselor: Your parents are pressuring you. How are they pressuring you?
- Student/client (avatars' fist clenched): They want me to get a job. I guess they are right. I need to find a job.
- Educator/counselor: As you said you need to find a job, I notice that your fists are clenched. You appear to be upset.

The educator also takes this time to demonstrate how to use the empty chair technique to assist the client. As time permits, the educator also asks a graduate teaching assistant to join the class and role-play an angry client who throws objects and punches the wall. The educator demonstrates how to verbally deescalate the client and how to safely exit the room if the client becomes physically violent (Figure 3).

In the remaining class time, students are asked to practice the new skills and break out into the classroom buildings' lab rooms. Triads of students go to various lab rooms throughout the 3-D virtual building. Students take turns using their avatars playing the role of observer, client, and counselor. Graduate teaching assistants join the sessions to assist students in practicing skills with difficult clients. For example, a graduate student with a "depressed, self-harming client" script may assist students in practicing the skill of completing a suicidal evaluation. This enables skill practice that is safe for the student and ensures no danger comes to the client. Additionally, the educator observes skill practices and provides live supervision by using the lab rooms' one-way mirrors. The educator uses the private text chat or the voice communication to assist students' in formulating responses and to provide corrective feedback.



FIGURE 3 Counseling session in second life.

The avatar, the voice tool, the chat tool, and the graphic environment are all tools within the SL environment that simulate the strengths inherent in F2F instruction for counseling skill courses. Avatars and voice tools enable the educator and students to interact with one another in a manner similar to a F2F classroom. The ability to engage in verbal communication enables students to practice and hone verbal counseling responses, thus supporting the goals of a counseling skills and techniques course (Council for Accreditation of Counseling and Related Educational Programs, 2009). The ability to generate nonverbal communication (facial expressions, gestures, and body language) using the specialized Heads-Up Displays (HUD) in this environment enables students to practice the important communicative and clinical function of observing nonverbals. Mouth movements in synch with speaking and physical gestures are built-in features of SL. Mouth movements can be activated through an advanced menu item in the program and physical gestures can be controlled through the avatar's inventory options or through a customized HUD. Facial expressions can also be added using customized HUDs and avatars with realistic features can be created for more realistic facial movements. Nonverbal communication in this environment may also enhance interaction among students (Antonišević, 2007).

Using scripted avatars (e.g., avatars under the control of teaching assistants who use role-play scripts) for role-plays of difficult clients enable students to practice skills in a safe environment. This aspect of the graphical environment enables practice that was previously physically or ethically difficult or impossible (e.g., dealing with a client who becomes physically aggressive or a client that conducts self-harming behavior during a session). The avatar also adds a sense of presence to the online environment that is present in the F2F classroom but is difficult to achieve in the asynchronous text based e-learning environment

(Childress & Braswell, 2006). The private chat feature enhances the live supervision process; the educator can provide live, immediate feedback and correction. This function is actually an added benefit that is not readily available in F2F supervision. The tools of the SL environment enable students to practice their skills in “counseling rooms” and enables practice often used in traditional training (Walker, 2009a). The use of collaborative conferencing systems, discussed next, provides further skill practice similar to that used in the traditional classroom.

Collaborative Conferencing Systems

Whereas SL is used for whole class lectures, demonstrations, and skill practice that are primarily physically or ethically difficult (e.g., deescalating a physically violent client or counseling a client who actively self harms in session) to complete in F2F or e-conferencing settings, an e-conferencing system, such as the Adobe Acrobat Connect or Skype, is used for small group skills practice, live supervision, and additional tutoring as needed. Collaborative conferencing software or e-conferencing, such as Adobe Acrobat Connect (previously Macromedia Breeze), Wimba, Skype, and Elluminate Live! (see Erlanger [2005] for a listing of additional e-conferencing systems), enables students in remote geographical locations to connect on the same screen in real time to work together and to practice their counseling skills using a set of integrated set of rich media tools. This set of tools includes (a) audio tools for voice-to-voice communication, (b) pooling tools for voting and hand raising, (c) web tools to direct participants' web browsers, (d) white board tools for drawing and writing, (e) application sharing tools for sharing a desktop or allowing participants to direct keyboard or cursor, (f) small group tools for placing participants in small groups, (g) push tools for giving participants content to view, and (h) record tools to record and archive meetings (Taran, 2004). As with the SL technology, prior to the first synchronous small group skill practice, students attend instructional sessions with the educator and instructional technologist to learn how to use the different tools within the technology, test their hardware, and troubleshoot technical problems.

In the HSC skills course, the e-conferencing software is used for two purposes: (a) small group discussion to analyze skill specific dramatic case studies provided by the educator and (b) triadic skill practice. To maximize the effectiveness of the system for skills training, each student has a headset and a video capturing device (e.g., webcam). This enables both their live, passport-sized or screen-sized image and voice to be transmitted over the Internet during the session.

After logging in and engaging in informal discussion, the students begin the session and activate the record feature. All sessions are recorded and archived for the purpose of the educator's and students' review. Furthermore, for triadic skill practice, students self-review and write a

verbatim transcript of a five to seven minute portion where they served as the counselor in the role-play.

Prior to the small group meeting to analyze a case study, a student in the group downloads the video case study for the target skill from the vodcasts platform and uses the e-conferencing's application-sharing feature to display the downloaded file that is playing on his or her desktop. The students watch the two-minute video clip and then discuss the strengths and weaknesses of the skills demonstrated in the video using both the audio and chat tools. During the discussion, one of the students opens up a Microsoft Word document and types key points from the discussion. Because the shared application function allows the document to be shared among users, the students within the group take turns adding to the document and highlighting important aspects of their critique. After the session, group members will post the document to their blogs to demonstrate their learning in the course.

Students also use the e-conferencing system for triadic skill practice. Students take turns playing the role of observer, client, and counselor. The students can see one another's faces in live, passport-sized images on their desktops and hear one another's voices during the practice. During some of the sessions, the educator visits to observe skill practices and provide live supervision. The educator uses the private text chat to type corrective feedback and uses voice communication to assist students' in formulating responses.

The video, voice tool, chat tool, and application sharing tools within the conferencing system enable students to interact with one another and have discussions in a manner similar to a F2F course. By engaging in synchronous learning activities such as the case analysis discussions that require problem-solving, critical thinking, and interaction, students exchange ideas and build a scholarly online community (Page et al., 2003). The tools of the e-conferencing system also enable the practice of counseling skills in a manner that mimics F2F practice. Similar to the SL environment, the ability to engage in verbal communication enables students to practice and hone verbal counseling responses; and the ability to watch real (not avatars) peers' nonverbal communication enables students to practice the important communicative and clinical function of observing nonverbals. The inclusion of the small group e-conferencing activities in the counseling skills course encourages knowledge construction, deepens understanding of concepts, and increases skill development (Marjanovic, 1999).

IMPLICATIONS

Although the integration of Web 2.0 technologies into a HSC skills course like the one described sounds very similar to a traditional skills course,

differences between this type of course and a traditional course exist. Considering differences and experience with Web 2.0 technology, these educators recommend the following when developing and implementing a skills course that integrates one or more of the Web 2.0 technologies described:

- Be realistic in the number of technologies adopted. Ensure that the integration of Web 2.0 technologies pedagogically enhance and do not overwhelm the students or the educator. The course described in this article is technologically intensive. In most instances, these educators have found that limiting the number of technologies used in the counseling skills course to two to three different types is helpful and decreases technological problems and frustrations for students.
- Adopt one synchronous technology per course; both can be too overwhelming for both the students and the educator. These educators have found that e-conferencing systems are useful for teaching a basic skills course and the SL environment is useful for more advanced techniques and models courses.
- Plan three to five times more time to develop and to implement this course as compared to a traditional course. Once the course is developed, many of its components (e.g., podcasts and vodcasts) are reusable and preparation is not as time intensive. During the development of this course, a course release or other type of compensation may be a wise request.
- Limit your class size. Given the demands for teaching an online course that integrates Web 2.0 technologies, researchers have stated that ideal online class size is 12 students (Tomei, 2006). An ideal number of students for the skills class described in this article is between 12–18, which is comparable to traditional skills classes at the graduate level.
- Ensure that sufficient technological support. The integration of Web 2.0 technologies into an online course requires technical knowledge and skill. Determine who in your university provides technology support to the faculty and students. Request their assistance in the development and implementation of the course. It is also a good idea to have an instructional technologist present during synchronous class times; he or she can assist with technological difficulties so that the educator can focus on the education.
- Account for the learning curve that exists. Depending on both your knowledge of technology and your students' knowledge of technology, you may have a large learning curve. Educators need to learn the technologies and also assist students in learning them. Interactive tutorials on each technology are helpful to assist students in learning how to use the technologies. Online resources can be helpful. Classroom 2.0 (www.classroom20.com) and Web 2.0 for the educator (www.kn.att.com/wired/fil/)

pages/listweb20s.html) are sites that provide tutorials and educator collaboration options.

- Collaborate not only with technology departments but with other educators. Other instructors within your department, across your university, or in your field may provide you with ideas to improve your courses using these technologies, or they may be interested in participating in projects with you. Collaboration makes the process more enjoyable and manageable.
- Be flexible. It was recognized that some activities and project dates may need to be flexible because technical difficulties are likely to occur or projects may take longer than projected.
- Require students to meet systems requirements in order to enter course or program. Outline requirements in student handbook or syllabus or provide a laptop that meets all system requirements and has all needed software as part of the tuition cost. Systems requirements for synchronous technologies discussed require broadband connections with good, stable connectivity and quality, thus these technologies are inaccessible and poor quality for students with dial-up or low bandwidth Internet connections.
- Anticipate and plan solutions for technological and user issues. Technology problems can be a source of concern and frustration; solutions need to be planned (see Table 2 for potential problems and solutions).
- Be aware of issues pertaining to confidentiality and consider FERPA and ethical governing board regulations. When using the Internet, students need to be made aware of who can access their work. For example, a public blog may be accessed by anyone on the Internet. A private blog may only be accessed by individuals that the blogger allows access. Depending on the nature of the work being done, decisions about confidentiality and access need to be made and students need to be informed about these decisions in the syllabus. Here is an example from a syllabus about the confidentiality and accessibility of a CMS, “The WebCT Vista, a Blackboard Inc. software, server is physically located on campus in the ITS building. Data is backed up at least once per day in an ongoing backup process; weekly backups of data, as a partial safeguard against database failure, are made and held by a data management system called Oracle Database, and the backup files are kept under password protection off site at the south campus. Although data stored on the server is kept in a password-protected database and are not shared with anyone, it is conceivable that engineering staff at the web hosting company may need to access the database for maintenance reasons. Additionally, it is important to note that the site does not use encryption technologies. Although highly not likely, any information you provide could be observed by a third party while in transit. Class data will remain stored on campus for the duration of two years after the course’s end date and then be deleted by an automatic process.”

TABLE 2 Potential Technology and User Problems and Solutions

Potential problems	Solution
Lack of knowledge or experience with web 2.0 technologies	<ul style="list-style-type: none"> • Create an online program handbook and/or course that provides students with all of the information and training needed to complete online courses within the program (similar to a library course required by a university or program). • Conduct synchronous training sessions using the e-conferencing system and desktop sharing to demonstrate how to use the different technologies. • Provide students with instructional designer or educator created printable handouts, videos, and/or Flash-based tutorials. • Provide links on course web page to tutorials and information about each of the technologies. • Limit technology adoption to one or two new technologies.
Difficulty locating specific learning areas	<ul style="list-style-type: none"> • In the CMS, provide a list of all URLs for all technologies used on the course. URLs should enable students to directly access and locate all sites used for the course. For example, a Slurl (Second Life URL) that allows users to “teleport” directly to learning location in SL is helpful.
Performance issues or technical difficulties with asynchronous (e.g., select features not working) and synchronous sessions (e.g., no sound, poor visual quality, lag time, etc.)	<ul style="list-style-type: none"> • Log out, clear cache, and log back in. • IT support that uses software that allows for remote desktop control is helpful (e.g., BOMGAR) • Require students to log in 10 minute prior to class start time to complete sound checks. • Plan for university IT support during all synchronous classes for troubleshooting (e.g., help students check drivers, firewalls, and preferences that may cause audio/visual issues). • If synchronous technology fails and makes it impossible for students to receive information needed or engage in an assignment, provide alternative options for synchronous instruction and skill practice (e.g., training videos and use of videotaped counseling sessions as an alternative to SL or e-conferencing sessions) • If plausible, use a chat feature as an alternative for audio communication problems. • Check university and software maintenance schedules and schedule class times around maintenance.
Inability to gain access to synchronous sessions or loss of connectivity that results in a person “disappearing” during synchronous sessions	<ul style="list-style-type: none"> • Record and archive synchronous sessions (using software recorders or other software such as Camtasia). • If synchronous technology fails for the instructor or entire class, set a location for students to meet, such as Facebook or Google Talk, and provide instructor contact information. • If synchronous technology fails for an individual (e.g., power outage, hardware or software problem, etc.), provide alternative options for synchronous instruction and skill practice (e.g., training videos and use of videotaped counseling sessions as an alternative to SL or e-conferencing sessions).

(Continued)

TABLE 2 Continued

Potential problems	Solution
	<ul style="list-style-type: none"> • Have more than one instructor or a teaching assistant who can conduct synchronous class if one instructor has technical difficulty. • IT support that uses software that allows for remote desktop control is helpful (e.g., BOMGAR)

CONCLUSION

The integration of Web 2.0 technology into an online HSC classroom takes time and technical knowledge; some technical difficulties may be a source of frustration and lack of technical support and knowledge may inhibit the adoption of some technologies. Despite the time and energy commitment required for development and implementation of this course and technological limitations, the potential advantages may be well worth the effort. Researchers are beginning to find that students are positively responding to the inclusion of Web 2.0 technologies into online HSC courses (see Rockinson-Szapkiw, 2009; Walker, 2009a, 2009b). Drawing from experience, the inclusion of Web 2.0 technologies into online HSC skills courses appears significant in supporting interpersonal interactions, promoting skill competence, and mimicking many aspects of the F2F skills class needed for quality training. The CMS provides organization. Podcasts and vodcasts engage students in the content. Blogs facilitate reflection, and wikis promote collaborative knowledge construction and a sense of community. Second Life enables practice that was previously physically or ethically difficult or impossible. Conferencing software adds the element of synchronous collaboration among students for triadic skill practice and the opportunity for live supervision. However, questions remain in regard to the effectiveness of Web 2.0 technologies to support the interpersonal interaction needed for acquisition of clinical skills. To date, effectiveness studies that compare online and traditional F2F courses have indicated no significant differences in grades, satisfaction, and perceived learning between groups (Russell, 1999; Siebert & Spaulding-Givens, 2006). Future comparative research that focuses on outcomes associated with clinical skills is needed. Specifically, the following questions remain unanswered: (a) is the online skills course supported by Web 2.0 technologies comparable F2F skills training in terms of skill acquisition? and (b) can skills learned in the e-learning environment transfer to a F2F counseling session as effectively as skills learned in a F2F course? Effectiveness studies should examine each Web 2.0 technology individually and combined, and research that examines the use of technology for online education should move past primarily anecdotal research (Romiszowski &

Mason, 2004; Rourke & Szabo, 2002) to “theoretically grounded and rigorous research” (Alavi & Leidner, 2001, p. 2; Gibson, 2003). Finally, as research emerges and effectiveness of the online medium for the teaching of clinical skills is better understood, researchers should make strides to examine the transformative nature of Web 2.0 technologies for teaching HSC clinical skills. As Twigg (2001) contended, research needs to move past evaluating “what has been” to “what can be.”

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