

ONLINE TECHNOLOGIES FOR ENGAGED LEARNING A Meaningful Synthesis for Educators

Lee Revere

University of Houston-Clear Lake

Jamison V. Kovach

University of Houston

Online education is well established in academia; however, the effectiveness of course design and student engagement remains uncertain. To deliver the highest quality online education, students should be engaged in learning exercises. Appropriately integrated technology can be used to foster student engagement, build a learner-centered environment, and make course content come alive. This article synthesizes information about well-established and relatively new technologies, such as discussion boards, chat sessions, blogs, Twitter, Skype, YouTube, and so on, to provide guidance for educators interested in integrating these tools within their online learning environment. Instructors who effectively incorporate technology as learning tools in their online courses can expect to achieve enhanced student engagement as well as higher levels of learning and more efficient classroom management.

INTRODUCTION

Academic educators continually seek methods to engage students in the learning process. Technology is at the forefront of this movement because technology, appropriately integrated with course content, furthers education by promoting a learner-centered environment through engaging activities. Whether technology is used to answer e-mails, view web content, or play online games, the users (i.e., students) are engaged in the process and are

actively seeking information through the technology. Educators have already realized the potential of technology for accessing various student populations. In fact, online education has experienced a tremendous growth rate in recent years as universities and private training companies convert face-to-face classes to online courses. A recent report estimates that online enrollment in higher education within the United States has doubled since 2002 to 3.94 million students in fall 2007 (Allen & Seaman, 2008). It is clear that the growth in

• **Lee Revere**, Associate Professor, Economics, Finance, Marketing and Decision Sciences Unit, School of Business, University of Houston-Clear Lake, 2700 Bay Area Blvd., Houston, TX 77058. E-mail: revere@uhcl.edu

The Quarterly Review of Distance Education, Volume 12(2), 2011, pp. 113–124
Copyright © 2011 Information Age Publishing, Inc.

ISSN 1528-3518
All rights of reproduction in any form reserved.

online education is ever increasing; however, the design of the learning environment and the level of student engagement is still emerging.

The engagement of students in an online course is especially important because “without intentional engagement of students, little, if any, learning will take place” (Association to Advance Collegiate Schools of Business, 2010, p. 58). In fact, the traditional approach to instructor led pedagogy is quickly being refuted in light of continuing research in student centered learning. This research suggests “learning depends wholly on what the student does; (and) only indirectly on what the teacher or university does” (Simon, 2001). Jensen (1998) found that the human brain processed information more effectively through short, focused lectures followed by engaging activities that allow for reflection. The Policy Center on the First Year of College found that engaging students in the pedagogy results in higher levels of learning (Swing, 2002) and the Higher Education Research Institute found engagement with peers, faculty, and the course itself resulted in higher student satisfaction (Sax, Keup, Gilmartin, Stolzenberg, & Harper, 2002). Through the integration of technology with traditional pedagogy, an online learner-centered environment can grow to its fullest.

Unfortunately, many online learning environments seek to replicate traditional classroom instruction by focusing on knowledge acquisition through a single knowledge authority (i.e., the instructor) and are not particularly supportive of student engagement (Adams, 2007). However, with the increased number of online courses, educators are finding that their place is no longer solely at the front of a classroom; instead, educators are often responsible for building online communities where they virtually mingle with students and facilitate student centered learning through virtual peer interaction (Bober & Dennen, 2001). One reason online education is not typically designed to foster student engagement and peer interaction is due, in part, to an educator’s limited time and knowledge about how to create an engaging online course. Technology advances

are so rapid that instructors rarely have time to identify, test, and integrate these developments into their online courses. “Globalization and technological advances in business regularly outpace developments of teaching and learning materials” (Association to Advance Collegiate Schools of Business, 2010, p. 56). However, today’s students are clamoring for more technology; technology for building relationships, communicating in real-time, collaborating within an online community, and engaging in the learning process. Designing an online learning environment that engages students and affords them opportunities to direct their learning requires the developer to consider the overall goals for student learning and to determine not only the knowledge acquisition requirements, but also the knowledge application activities and strategies that foster engaged discovery (Adams, 2007). Successfully engaging students, coupled with a learner-centered approach, has been shown to decrease attrition (Angelino, Williams, & Natvig, 2007), while fostering peer interaction through group assessments has been shown to increase student performance and enhance course satisfaction (Revere, 2003).

To support online teaching, many instructors use course management systems such as Blackboard, WebCT, or Moodle (The Campus Computing Project, 2008). These are powerful platforms that allow instructors to post course related materials and interact with students through asynchronous discussion boards and/or synchronous online chat sessions. Unfortunately, the current systems do not fully support the level of engagement desired by today’s online students. “Despite the advances in technology, existing online course management systems are often far behind in the technological applications needed to deliver the highest quality online education” (Li, 2007, p. 311). Course management systems often do not address mobility and availability issues related to online instruction that affect both students and instructors alike. Students who travel frequently may not be able to login to the online course management system frequently; there-

fore, they may have trouble keeping up with course announcements and assignment due dates (Li, 2007). Instructors of online courses, on the other hand, face increasing pressure to be available to assist students 24 hours a day, 7 days a week (Keeton & Scholar, 2004); therefore, much of their time is spent checking email/discussion boards and responding to student questions. Unfortunately, the value of these activities, in terms of their impact on student learning outcomes, is uncertain. In addition, online courses often rely heavily on static learning materials that do not address students' diverse modes of learning (Romero & Ventura, 2007). To address these issues and foster a learner-centered engagement, the capabilities of existing online course management systems can be supplemented by incorporating additional communication technologies, web-based applications and handheld/mobile devices within online courses.

STUDY AIM

This article synthesizes methods for engaging online students through effective course design and technology integration. First, the manuscript discusses how to engage students in an online environment using traditional technologies that are easily integrated into online course management systems, such as discussion boards, chat sessions, blogs, wikis, group tasks, and peer assessment. Existing literature is synthesized to provide a background for understanding the effectiveness of these technologies, their benefits, and their limitations. Second, the manuscript explores free web-based applications that are well established in the online environment, but that are relatively new to academia, such as Twitter feeds, Google e-mail/calendar/tasks/documents, audio and video technologies, collaboration tools, and online content. The value of these web-based applications relative to online education and student engagement is discussed through a descriptive narrative about how each tool can be integrated into an online course and

its usefulness. Consideration is given throughout this discussion about the universal application of each technology, the ease of integration, and the ability to use the technology on handheld/mobile devices (e.g., BlackBerry, iPhone, Droid, iPad, etc.). As a whole, this manuscript provides educators with the knowledge they need to create engaging, technology-driven and collaborative learning opportunities for their students.

TRADITIONAL TECHNOLOGIES FOR ENGAGED LEARNING

Conventional wisdom suggests that engaged and relational learning is far more likely to grow out of a learner-centered (rather than a teacher-centered) instructional environment. "Teacher-student interactions have traditionally been validated more than peer interaction in a learning scenario, presumably because the teacher is the expert and the more experienced participant. The reality of the situation, however, is that learners are affected by the utterances of their peers" (Bober & Dennen, 2001, p. 242); thus, online learning environments should be designed to facilitate social activities that allow exploration of individual histories and values (Moule, 2006). Technologies traditionally used to promote learner-centered engagement and peer interaction include discussion boards, chat sessions, blogs, wikis, group tasks, and peer assessment.

Discussion Boards

Discussion boards promote student engagement and peer interaction by providing (1) a mechanism for students to increase their knowledge through student driven content and/or (2) a forum for peer review and exchange that creates a supportive climate within online classes. "The discussion board supports mutual accountability and there is evidence that students give advice and share resources with fellow group members" (Moule, 2006, p. 376). In addition, "participation in the weekly

discussion board group appeared to have a strong positive impact on the likelihood of students making new friendships” (Farquharson, 2007, p. 54). Although discussion boards can foster camaraderie, the literature shows little evidence that discussion boards deepen analytical and evaluative skills; in fact, students often struggle to move beyond sharing knowledge to recognizing, understanding, and beginning their own process of analysis (Miers et al., 2007). Furthermore, posting delays in discussion board communication are problematic when students need immediate feedback and/or when some students “lurk” (i.e., learn from others without making a significant contribution) (Moule, 2006).

Chat Sessions

Chat sessions are commonly used in online courses to engage students and foster instructor-student interactions. Chat sessions are often preferred over discussion boards because they overcome the communication delays that frustrate discussion board users. In certain circumstances, online chats encourage spontaneous interactions among students and faculty that may build positive relationships and the foundations for learning communities (Angelino et al., 2007). There are, however, a number of documented chat session issues. Bober and Dennen (2001) report the underlying pedagogy of chat is suspect, as well as its usefulness for building shared understandings that help students relate one situation to another. Other documented issues include good typists dominating the conversation, out-of-sync contributions, overwhelmed participants when basic protocols (good manners) are consistently ignored, overlooked comments, and comments that indicate the reader was unsure of a previous remark’s context (Bober & Dennen, 2001).

Blogs

In terms of structure and response time, blogs fall somewhere between discussion

boards and chat sessions. Like discussion boards, blogs are web-based applications that involve students in the learning process by allowing them to post their own content online (i.e., directly to the web and/or through the course management system) (Meyers, 2008). Content developed by students and posted through blogs may consist of many things—short essays in response to readings, brief interviews with experts, or reviews of artwork, for example. Therefore, class-related blogs provide a forum for students to share their learning, ask questions of their peers, discuss a topic, comment on their reactions to the course/assignment, et cetera, and research has shown that the use of blogs substantially enhances students’ overall learning experience (Shim & Guo, 2009). In addition, blogs can be easily integrated with handheld and/or mobile devices, which may promote faster response time compared with discussion boards. Blogs may also foster communication better than a discussion board because younger students are adept at blogging and may be more likely to participate in a blog versus a discussion board. Blogs also “provide a means of collecting and organizing fresh insights and opinions” (Dearstyne, 2005, p. 40), which instructors can use as an indirect method for gauging student feelings toward the course and obtaining feedback on course goals and objectives. In general, blogs require only an affordable, easy-to-use software interface, such as Blogger, for example, and limited, yet flexible maintenance efforts (Dearstyne, 2005).

Wikis

Wikis are a technology that can be used in online classes to support simple web pages that groups can edit together. This technology promotes student collaboration by providing a space where students can create and edit content online, which is useful for engaging students when assignments involve defining or researching selected topics or when an entire class is required to contribute to the final work product (Meyers, 2008). However, the compo-

sition of the group can affect the group's performance; thus, online educators must consider the group's familiarity with one another and/or incorporate a group socialization process in the learning activity (Moule, 2006). For example, Angelino et al. (2007) proposed unique methods for engaging online students in a socialization process, such as a "virtual icebreaker" to stimulate communication, which could be hosted within a discussion board, chat session, blog, or wiki.

Group Tasks

Group tasks are concerted efforts to facilitate student interaction with their peers, which encourages engaged learning and is seen by students as an important learning tool (Lightner, Bober, & Willi, 2007). For example, online learners are frequently required to work together on group projects (Robinson & Hullinger, 2008). Effectively designed group projects encourage students to develop relationships with other students where they can explore and expand their existing knowledge base together. Group assignments promote learning communities and help online students overcome physical separation as well as feelings of disconnection, isolation, and lack of support (Angelino et al., 2007). However, as with any group project, instructors need to help teams identify how they will work together and ensure the workload is equitable among all team members.

Peer Assessment

Online learning environments that routinely engage students in learning activities require peer assessments. Peer assessment exercises are central to supporting individual learning and engagement because they require students to collaborate on assessment criteria and aid in self assessment and reflection (Miers et al., 2007). For example, one case study describes a "public opinion system," that allows students

to receive peer ratings on the appropriateness of their simulation game decisions. The instructors for this course found that this assessment methodology

allowed class members to truly coconstruct meaning in the game, because their opinions (not those of the administrators) determined what decisions were most valued. Student teams spent time and energy justifying their decisions, not just because the instructor told them to or the system demanded it (although both were true), but also because their peer ratings and success in the game depended on the quality of their justifications. (Bos & Shami, 2006, p. 517)

Similarly, linking group activities that necessitate the involvement of group members to the assessment process can improve engagement (Moule, 2006). The potential downside of peer assessment is the tendency for students to favorably grade their peers, regardless of actual peer performance or peer knowledge. In addition, students' evaluations of one another's work may be biased if they do not have a clear understanding of the assessment criteria.

To close this section, Table 1 provides a brief synthesis of the technologies described thus far. This table highlights the advantages and disadvantages of each tool and provides further guidance for educators about how to implement these technologies within their online courses. Web links to specific resources are noted at the end of the table.

WEB-BASED APPLICATIONS TO IMPROVE ENGAGEMENT

Although discussion boards, chat sessions, blogs, wikis, group tasks, and peer assessments can facilitate student engagement, integrating additional (free) web-based technologies can take online courses to a higher level of engagement. The existing breadth and depth of technology designed for online socialization is immense and its porta-

TABLE 1
Summary of Traditional Technologies for Engaged Learning

<i>Technology</i>	<i>Advantages</i>	<i>Disadvantages</i>	<i>Implementation</i>
Discussion boards (Ning networks, ¹ etc.)	<ul style="list-style-type: none"> Facilitates peer interaction Supports student driven content Creates supportive climate Fosters camaraderie 	<ul style="list-style-type: none"> Does not deepen analytical and evaluative skills Asynchronous communication (i.e., posting delays) Potential for student “lurking” 	Instructor sets-up discussion board in course management system or elsewhere. Instructor provides “prompts” to direct student learning activities within the discussion board and may post comments from time to time, depending on the nature of the assignment.
Chat sessions (Google Talk, ² Windows Live Messenger, ³ etc.)	<ul style="list-style-type: none"> Supports student driven content Fosters spontaneous student interaction (synchronous communication, no communication delays) 	<ul style="list-style-type: none"> Underlying pedagogy is questionable Good typists may dominate conversation Tendency for out of sync contributions and overlooked/ misread comments 	Instructor selects chat mechanism and establishes guidelines (i.e., schedule, discussion topic, etc.) for the learning activity. Instructor may participate in the chat session, depending on the nature of the assignment.
Blogs (Blogger, ⁴ etc.)	<ul style="list-style-type: none"> Supports student driven content Involves students in the learning process Enhances students’ overall learning experience 	<ul style="list-style-type: none"> Asynchronous communication (i.e., posting delays) Posts are typically longer than that seen in discussion boards or chat sessions 	Instructor sets-up the blog, emails the link to the class, and monitors the content posted by students. Students can post their comments, report the status of their projects, ask/answer questions, etc. A notification can be created so that the class is automatically notified about each new posting, and students can post directly to a blog using their handheld/mobile devices.
Wikis (Wikidot, ⁵ etc.)	<ul style="list-style-type: none"> Promotes student collaboration on assignments/tasks 	<ul style="list-style-type: none"> Composition of group can affect performance due to socialization issues 	Instructor sets-up wiki (hosted through a web page), e-mails the link to the class, and develops the assignment. Instructor can periodically review the work complete by students within the wiki.
Group tasks	<ul style="list-style-type: none"> Facilitates peer interaction Encourages learning Provides support (i.e., overcomes feelings of disconnection and isolation) 	<ul style="list-style-type: none"> Team must identify how they will work together virtually Work equity may not be equal among group members 	Instructor creates the group assignment/project including detailed instructions about the deliverables. Instructor can suggest virtual collaboration tools that teams can use to work together and outline roles and responsibilities for each team member promote equity of work.
Peer assessment	<ul style="list-style-type: none"> Promotes student collaboration on assessment criteria Facilitates self assessment and reflection Encourages peers to coconstruct meaning 	<ul style="list-style-type: none"> Assessments may not reflect actual peer performance or knowledge Evaluation may be biased if assessment criteria are not well understood by students 	Instructor can either (1) develop assessment instrument and have students use it to rate their peers or (2) involve students in the development of the assessment instrument. Instructors should encourage students to take the assessment process seriously and provide clear definitions for the assessment criteria.

Note: ¹www.Ning.com; ²www.google.com/talk/; ³messenger.msn.com; ⁴www.blogger.com; ⁵www.wikidot.com.

bility gives students the advantage of interacting with the instructor, their peers, and even the course content from virtually anywhere,

using a variety of electronic devices. Students are typically quite adept at using Internet technologies and their associated features to “con-

nect” with their peers and engage in meaningful exchanges. Unlike the technologies built into traditional online course management systems, which both students and instructors often report are cumbersome, students find the Internet technologies easy to use and adaptable. Thus, the challenge for online educators is to capitalize on students’ familiarity and access to online interfaces. This section discusses enhancing student and course experience by integrating web-based applications such as Twitter feeds, Google email/calendar/tasks/documents, audio and video technologies, collaboration tools, and online content.

Twitter Feeds

Twitter is a free application that can be used to improve two-way course communication, thereby fostering engagement in online learning environments. Twitter is a micro blog that can be used by instructors to alert students about course related announcements. Wetzel (2009) describes additional uses for Twitter in the online classroom to engage students in a meaningful manner, which include gathering data, communicating with experts, and learning about current events. Unlike announcement tools within traditional course management systems, Twitter feeds are a convenient form of communication that many students already use on a daily basis. Students can access Twitter through applications like Twitterrific on their handheld and/or mobile devices; therefore, students are more likely to receive and respond to class announcements made through this platform as opposed to announcements posted within an online course management system, which requires that students login through a computer interface. It is important to note, however, that Twitter feeds may not be as effective for communicating with a student population that does not generally have handheld/mobile devices or are not continually connected to the Internet, because they may not be able to receive and respond to announcements in a timely manner.

Google Applications

Several free applications available through Google can be used to communicate with students, facilitate task execution, improve course management, and engage students in the learning process. Google calendar is useful for organizing and sharing classroom lesson plans. Because it can be accessed from any computer or handheld/mobile device, students can view updates to the course calendar immediately, without having to login to the online course management system. In addition, unlike the calendars embedded within online course management systems, Google calendar can be integrated with students’ other online/personal calendars. In addition, Gmail is a Google e-mail application that is easy to integrate within an online course, and it is accessible via handheld/mobile devices. Through Gmail, a group e-mail address will allow the class to communicate with the instructor and peers simultaneously because questions and information can be directed to the entire group (including the instructor). One of the most obvious advantages of Gmail over an e-mail system embedded in an online course is its ability to facilitate more real-time communication because both the instructor and students can respond to questions or comments posted about the course. In existing online course management systems, a single student typically emails questions to the instructor directly, who may take 24 hours (or more) to respond. Thus, a large benefit of using Gmail is the ability for students to receive immediate notifications, via handheld/mobile devices about course-related e-mails. Assuming students collaborate to answer each other’s questions, students naturally engage in an informal peer mentoring process. Student-led mentoring also reduces the burden of the instructor to be the sole source of answers and improves the likelihood of receiving a timely response. However, the instructor should acknowledge the possibility that two different e-mail communication streams—one in Gmail and one in the online course itself—may evolve. Maintaining these

two different communication pathways may be necessary in order for students to communicate privately with the course instructor about sensitive course issues.

Audio and Video Technologies

Because communication within online text-based systems does not always flow as naturally as in face-to-face settings, many audio/video communication technologies have been developed to facilitate student engagement in online classes (Wimba, 2008). One example is the Wimba Collaboration Suite, which includes a synchronous virtual classroom that supports audio, video, and content/application sharing. Wimba also includes a communication platform that supports instant messaging, virtual office hours, web-based voice tools, voice-enabled e-mail, and live group discussions and debates. Voice tools, such as VoiceThread, bring traditional threaded discussions to life, thereby engaging students in meaningful communication with both their peers and the instructor (Pacansky-Brock, 2010). In addition to the engagement benefits of audio and video communication, these communication technologies can be used to replace text-based feedback on assignments with asynchronous audio feedback. Research suggests that students overwhelmingly prefer audio feedback over the more traditional methods of text-based feedback and that they have few negative perceptions of the technique even through it is asynchronous (Ice, Curtis, Phillips, & Wells, 2007). Conference calling and web conferencing tools also provide convenient ways for online groups to participate in real-time group tasks/projects. Technologies like Wimba, PowWowNow and Skype make it easy for students and instructors to setup dial-in numbers for conference calls as well as links for web conferences. These technologies are often familiar to many students and can be accessed via handheld/mobile devices. Integrating audio and video communication technologies with online instruction promotes higher levels of student engagement and may

lead to increased student satisfaction and enhanced learning experiences.

Collaboration Technologies

Several additional applications can be used to foster collaboration within online learning environments. For instance, when assigning tasks instructors can use Google tasks, which allow all users to view a single task list. Students can then break this list down into further detail and create specific tasks under certain students or groups, thereby differentiating learning and fostering collaboration on assignments. Currently, task lists cannot be created in many online course management systems. Google documents, or Google docs for short, also allows students to work on assignments simultaneously. Using this technology, a single spreadsheet can be used by the entire class, at different locations, to collaborate on a class project that involves data collection. Instructors can also use Google docs to collect information from students to use in lectures, discussions, and/or demonstrations for the class. Files created in Google docs will exist on the Internet and not within the online course management system, allowing students to access and/or edit the files via their handheld and/or mobile devices. Using data that are collected collaboratively fosters student engagement and interest in the coursework.

Further collaboration and engagement in online courses can be promoted through the use of social networking sites, such as Facebook or Ning networks. These applications support the exchange of "social information," which online students often report missing due to the absence of face-to-face meetings. Research has shown that online environments that encourage the sharing of personal stresses and life events seem to foster cohesion between students, which supports both social and cognitive engagement (Miers, Clarke, & Pollard, 2007). To accomplish this, instructors can use social networking sites to post their introductions and encourage students to make similar posts (Angelino, Williams, & Natvig,

2007). The simple exercise of posting introductions allows online students an opportunity to learn more about each other early in the course. Other features within the sites, such as the ability to post status updates, links, pictures, and videos, facilitates keeping online students connected throughout the course. Social networking sites can also be linked to the online course management system allowing students to complete their assignments through the course management system or by logging-in to the networking site directly. Like other technologies, these sites provide flexibility because they are not solely instructor controlled and can often be tied to students' handheld/mobile devices.

Online Content

The Internet is wrought with online learning content, and instructors who are willing to invest the time to identify useful content can be well rewarded. There are several applications available to help find online content that can be used in conjunction with online courses. Students and instructors will find Google Scholar is easy to use for searching reputable journal articles and books. Wikipedia is a useful source for researching a specific topic and provides a free mobile application that allows students to read, search, and browse Wikipedia articles from a handheld/mobile device. Instructors can go one step further and use Google's free custom search engine to narrow down the websites that students may use when doing research for a project. This technology encourages students to review appropriate references and will reduce the time students spend searching for sources of reliable information.

With the volume of videos and podcasts that are available online, it is useful for instructors to provide students with guidance and/or direct links to content that is applicable to course learning outcomes. Today's students spend hours online and content that is provided in an online medium is likely to be watched via a computer or a handheld/mobile device. For

instructors this means students are more likely to "take" the content with them and watch it at their convenience. Websites known for providing instructional context include, but are not limited to, YouTube, TeacherTube, and iTunes U (i.e., iTunes University—a special area within iTunes where users download content specific to a particular university or course). To share these resources with students, instructors can either download materials and post them within the online course management system or send students the link to access the information.

Online instructors, classes, or individual students who want to create online content and enhance student learning have a number of options. Kovach, Ding, and O'Neil (2010) suggest ways that student created podcasts and video productions can be used to enhance student learning experiences. Authoring tools such as Jing, CamStudio, ScreenToaster, and PodBean, among others, allow users to make screen recordings, create podcasts/vodcasts, and much more. One of the main uses for such content often include expert interviews, pre-recorded lectures, how-to instructions, and/or recorded project presentations. General educational outcomes of using recorded lectures/podcasts for instructional purposes include flexibility, portability, repeatability, multitasking, and increased interaction (i.e., student-to-student and student-to-instructor) (Pedersen, 2005). In addition, both YouTube and TeacherTube provide an easy to use interface for instructors to post their own educational videos or podcasts online. Another option for disseminating content that instructors or students create is iTunes or iTunes U.

Table 2 summarizes the technologies described in this section, highlighting the advantages and disadvantages of each. This table also discusses how these technologies can be used to support engagement in an online course. In addition, specific resources are listed at the end of the table with corresponding web links that instructors can visit for further information.

TABLE 2
Summary of Web-based Applications to Improve Engagement

<i>Technology</i>	<i>Advantages</i>	<i>Disadvantages</i>	<i>Implementation</i>
Twitter feeds ¹	<ul style="list-style-type: none"> Facilitates students receiving announcements and alerts rapidly Support the exchange of information between students, instructor, experts, etc. 	<ul style="list-style-type: none"> Students need continual access to Twitter feed (via a handheld/ mobile device, computer, etc.) 	Instructor sets-up a Twitter account for the class (see business.twitter.com/twitter101/) and periodically posts course related announcements, etc. To receive announcements, students must have a Twitter account, which is free, and then simply opt to “follow” the username associated with the course feed.
Google applications (Google Calendar, ² Gmail, ³ etc.)	<ul style="list-style-type: none"> Organizes and shares lesson plans Integrates with other calendars Facilitates peer interaction/ mentoring Accessible via handheld/mobile devices 	<ul style="list-style-type: none"> Some students may not be familiar with these applications Two unique e-mail streams may evolve 	Instructor sets-up a calendar in Google and shares this with students. Instructor establishes a Gmail account via Google and establishes a Google Group ⁴ for the class with its own group e-mail address. Instructor adds students to the group and instructs them to use the group e-mail address. The calendar can be updated by the instructor daily/weekly and emails can be sent by anyone in the group as needed.
Audio and video technologies (Wimba, ⁵ Voice-Thread, ⁶ Pow-Wow-Now, ⁷ Skype, ⁸ etc.)	<ul style="list-style-type: none"> Synchronous audio and video communication (no delays) Supports live discussions/debates/ presentations Facilitates audio feedback on assignments (preferred by students) 	<ul style="list-style-type: none"> Students may need a small amount of time learn how to use these applications efficiently Audio feedback on assignments is asynchronous communication (i.e., posting delays) 	Instructor selects audio/video communication technologies to be used in the course and develops corresponding assignments. Instructor sets-up instructor controlled technologies and students or instructor sets-up noninstructor controlled technologies as needed, depending on the nature of the assignment.
Collaboration technologies (Google Tasks, ⁹ Google Docs, ¹⁰ Facebook, ¹¹ Ning, ¹² etc.)	<ul style="list-style-type: none"> Organizes and shares task lists Facilitates synchronous authorship of documents/spreadsheets Fosters camaraderie through social networking 	<ul style="list-style-type: none"> Students need to access the Internet often to complete their work (via a handheld/mobile device, computer, etc.) 	Instructor sets-up a task list and/or creates document/ spreadsheet in Google and e-mails the link to access the tasks/ files to the class. Each student can then access the link on their computer or handheld/mobile device and students can update the necessary files simultaneously. Social networking sites are created by the instructor and/or students and shared.
Online content (Applications for posting, ¹³ searching, ¹⁴ creating, ¹⁵ etc.)	<ul style="list-style-type: none"> Supports connections to additional course related information online Provides course related content in formats students are familiar with Accessible via handheld/mobile devices 	<ul style="list-style-type: none"> Students may become overwhelmed by an excessive amount of content Students may need tutorials to learn how to record and post content 	Instructor identifies links (often within the course management system) to course related content online. Instructor records and posts additional content and/or instructor develops assignments that incorporate the use of technology in which student record and post assignments.

¹twitter.com, ²google.com/calendar; ³mail.google.com/mail/; ⁴groups.google.com; ⁵www.wimba.com; ⁶voicethread.com; ⁷www.powwownow.com; ⁸www.skype.com; ⁹mail.google.com/mail/help/tasks/; ¹⁰docs.google.com; ¹¹www.facebook.com; ¹²www.Ning.com; ¹³scholar.google.com, www.wikipedia.org, www.google.com/cse/; ¹⁴www.youtube.com, www.teachertube.com, www.apple.com/education/itunes-u/; ¹⁵www.jingproject.com, camstudio.org, www.screen-toaster.com, www.podbean.com.

CONCLUSION

Many educators believe that their role is to add value to their students' learning experience; hence, instructors often develop innovative programs or activities to create a learner-centered environment aimed at enhancing learning outcomes. The rapid rise of online learning and related technologies presents a tremendous opportunity for educators to design courses that engage students through the use of technology. When used appropriately, technology can foster student engagement in the learning process, which many students find beneficial and research has shown to decrease attrition, enhance learning outcomes, and improve student satisfaction. Unfortunately, a learner-centered approach has not been widely adopted in online education. Some reasons for this include course management systems that lack the functionality to support student engagement activities and reports from instructors that it is challenging to keep pace with current online technology and content.

As the volume of online content and the availability of technology continues to grow, online educators need up-to-date information about how to effectively integrate both online content and technology in their courses. This work provides a meaningful synthesis of online technologies that educators can use to promote more engaged student learning. The ability to identify the advantages and disadvantages of both traditional and web-based applications will assist instructors with more effective course design within their online courses. In addition, understanding what resources are available and how they might be used to foster instructor-student interactions as well as peer interaction will contribute to appropriate technology integration and the fulfillment of students' need for active course content and engaged learning. Armed with the information presented in this paper, online educators will be better able to effectively use course management systems and supplement their capabilities with web-based applications,

thereby creating an engaging learning environment.

REFERENCES

- Adams, N. B. (2007). Toward a model for knowledge development in virtual environments: Strategies for student ownership, *International Journal for Social Sciences*, 2(2), 71-77.
- Allen, I. E., & Seaman, J. (2008). *Staying the course: Online education in the United States*. Needham, MA: Sloan Consortium.
- Angelino, L. M., Williams, F. K., & Natvig, D. (2007). Strategies to engage online students and reduce attrition rates. *The Journal of Educators Online*, 4(2), 1-14.
- Association to Advance Collegiate Schools of Business. (2010). *Eligibility procedures and accreditation standards for business accreditation*. Tampa, FL: AACSB International.
- Bober, M. J., & Dennen, V. P. (2001). Intersubjectivity: Facilitating knowledge construction in online environments. *Educational Media International*, 38(4), 241-50.
- Bos, N., & Shami, N. S. (2006). Adapting a face-to-face role-playing simulation for online play. *Educational Technology Research and Development*, 54(5), 493-521.
- The Campus Computing Project. (2010). *The 2008 National Survey of Information Technology in US Higher Education*. Retrieved from <http://www.campuscomputing.net/survey/>
- Dearstyne, B. W. (2005). Blogs: The new information revolution? *Information Management Journal*, 39(5), 38-44.
- Farquharson, K. (2007). Fostering friendships amongst a group of first-year university students: the use of online learning software. *Australian Journal of Emerging Technologies and Society*, 5(1), 48-57.
- Ice, P. et al. (2007). Using asynchronous audio feedback to enhance teaching presence and student sense of community. *Journal of Asynchronous Learning Networks*, 11(2), 3-25.
- Jensen, E. J. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Keeton, M. T., & Scholar, S. (2004). Best online instructional practices: Report of phase I of an ongoing study. *Journal of Asynchronous Learning Networks*, 8(2), 75-100.

- Kovach, J. V., Ding, D. X., & O'Neil, S. L. (2010). Using podcasting and video productions to create valuable student learning experiences. *Quality Advances in Higher Education: A Supplement to The Journal for Quality and Participation*, 1(1), 10-17.
- Li, X. (2007). Intelligent agent-supported online education. *Decision Sciences Journal of Innovative Education*, 5(2), 311-331.
- Lightner, S., Bober, M. J., & Willi, C. (2007). Team-based activities to promote engaged learning. *College Teaching*, 55(1), 5-18.
- Meyers, S. A. (2008). Using transformative pedagogy when teaching online. *College Teaching*, 56(4), 219-24.
- Miers, M. E., Clarke, B. A., & Pollard, K. C. (2007). Online interprofessional learning: The student experience. *Journal of Interprofessional Care*, 21(5), 529-542.
- Moule, P. (2006). E-learning for healthcare students: Developing the communities of practice framework. *Journal of Advanced Nursing*, 54(3), 370-380.
- Pacansky-Brock, M. (2010). Online teaching strategies: Building an interactive learning environment. Retrieved from <http://blogs.teachingwithoutwalls.com/blog/2010/04/02/tww-webinar-online-teaching-strategies-building-an-interactive-learning-environment>
- Pedersen, C. M. (2005). Encyclopedia of educational technology: Podcasting in education. *Encyclopedia of educational technology*. Retrieved from <http://www.etc.edu.cn/eet/eet/>.
- Revere, L. (2003). An approach to improving student performance, assessment, and satisfaction. *Southwest Business Administration Journal*, 3(1), 70-76.
- Robinson, C. C., & Hullinger, H. (2008). New benchmarks in higher education: Student engagement in online learning. *The Journal of Education for Business*, 84(2), 101-109.
- Romero, C., & Ventura, S. (2007). Educational data mining: A survey from 1995 to 2005. *Expert Systems with Applications*, 33(1), 135-46.
- Sax, L., Keup, J., Gilmartin, S., Stolzenberg, E., & Harper, C. (2002). *Findings from the 2002 administration of Your First College Year (YFCY): National aggregates*. Los Angeles, CA: Higher Education Research Institute.
- Shim, J. P., & Guo, C. (2009). Weblog technology for instruction, learning, and information delivery. *Decision Sciences Journal of Innovative Education*, 7(1), 171-193.
- Simon, H. (2001). Cooperation between educational technology and learning theory to advance higher education. In R. Goodman (Ed.), *Technology enhanced learning: Opportunities for change* (pp. 61-74). Mahwah, NJ: Erlbaum.
- Swing, R. (2002). The impact of engaging pedagogy on first-year seminars. In *Essays describing the results of a National survey of first-year seminars*. Columbia, SC: The Policy Center on the First Year of College.
- Wetzel, D. R. (2010). 12 expert twitter tips for the classroom: Social networking classroom activities that employ critical thinking. Retrieved from http://teachingtechnology.suite101.com/article.cfm/12_expert_twitter_tips_for_the_classroom
- Wimba. (2008). *Academic research makes a case for the Wimba Collaboration Suite*. New York, NY: Wimba.

Copyright of Quarterly Review of Distance Education is the property of Information Age Publishing and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.