Social Media, Smart Phones, and e-Learning for Safety and Health Professionals

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Introduction

Advances in communication technologies have progressed so quickly that many may feel like they've been left on the outside looking in. Digital information, advanced technologies, and even the environments where these vanguards are used can appear to go by like speeding freight trains. Observing this can be scary, especially when we believe we should be understanding and participating in it.

A natural reaction is to be skeptical or even afraid of recent progress in digital communications. It may be easier to pass the buck or wait for the next technology to come along. However, this perception is an impediment to effectively differentiating useful or needed technologies from recreational distractions. For instance, are we in a position where we can decide if the technology provides rapid accessibility to helpful safety and health information or if it is simply an expensive toy that will slow us down? Being able to answer this question is an essential skill in today's workplaces.

Outside of work, communication technologies can enrich lives by bringing together family and friends who may be separated by large physical distances. However, like other media or sources of recreation, these technologies must be managed for our benefit and management takes time.

In this paper, information is presented in several of communication technology that can help safety and health professionals perform their work more effectively, as well as enjoy their e-leisure time more fully.

Communication Technologies Now in Use

Social media and smart devices are two of the top seven most important information technology growth areas for the current calendar year (CNS, 2011). By 2015, it is projected that e-learning in at least one online course will be the preference for 25 million higher-education students in the US (Nagel, 2011), with nearly 4 million exclusively taking online courses. These three, specifically social media, smart phones, and e-learning are accessible to nearly everyone with a computer and internet access, and they're here to stay. Everyone needs to become familiar with them.

Social Media

Merriam Webster (2011) defines the term social media as "forms of electronic communication through which users create online communities to share information." Related terms are social networking and social networking site. The former is a system of social interactions and relationships (Oxford English, 2011) and the latter is a website that can be personalized for promoting social interaction (Downing, 2009).

The best-known examples of social networking sites are MySpace (www.MySpace.com) and Facebook (www.facebook.com). Twitter (www.twitter.com) is a third example that is technically referred to as a microblogging site (Downing, 2009). A fourth site that is gaining popularity professionally is LinkedIn. These sites are used by millions, although MySpace appears to be rapidly losing popularity. Facebook boasts of having "more than 500 million active users" (Facebook, 2011). Numbers of MySpace users peaked in 2007 but have declined since. QuantCast (2011[a]) estimates a precipitous decline of 20 million MySpace users from approximately 45.4 million in August 2010 down to 27.8 in January 2011. Twitter claims to have 175 million registered users (Twitter, 2010) and its numbers of users appear to be steadily growing. LinkedIn claims 90 million users (LinkedIn, 2011), although QuantCast (2011[b]) reports 46.1 million visitors, which indicates that there are many registered members of LinkedIn who do not use the service.

Facebook and Twitter are both used for personal and business purposes in a wide range of areas. MySpace, however, is primarily limited to personal use and entertainment-related media. Many companies make use of Facebook for advertising and to attract "likes" because of this service's overall popularity. Twitter is often used by businesses to engage and maintain the interest of customers, although there is not currently a clear commercial-use approach in place like with Facebook. LinkedIn is focused on business activities and promoting work-related "connections." All these sites are free, provided users are willing to share some personal information.

MySpace

Of the large-scale social media sites, MySpace was the first. It is also the least suitable for safety and health professionals. MySpace describes itself as an entertainment site. While its makeup is not conducive for work-related activities, many may find it enjoyable during leisure time. Upon logging in to MySpace.com with a standard web browser, users will find status posts from major entertainers in film, music, and comedy. Users may also read and comment on posts from "friends," who may be actual friends or family, or who may be online acquaintances. MySpace users can listen to music or watch videos
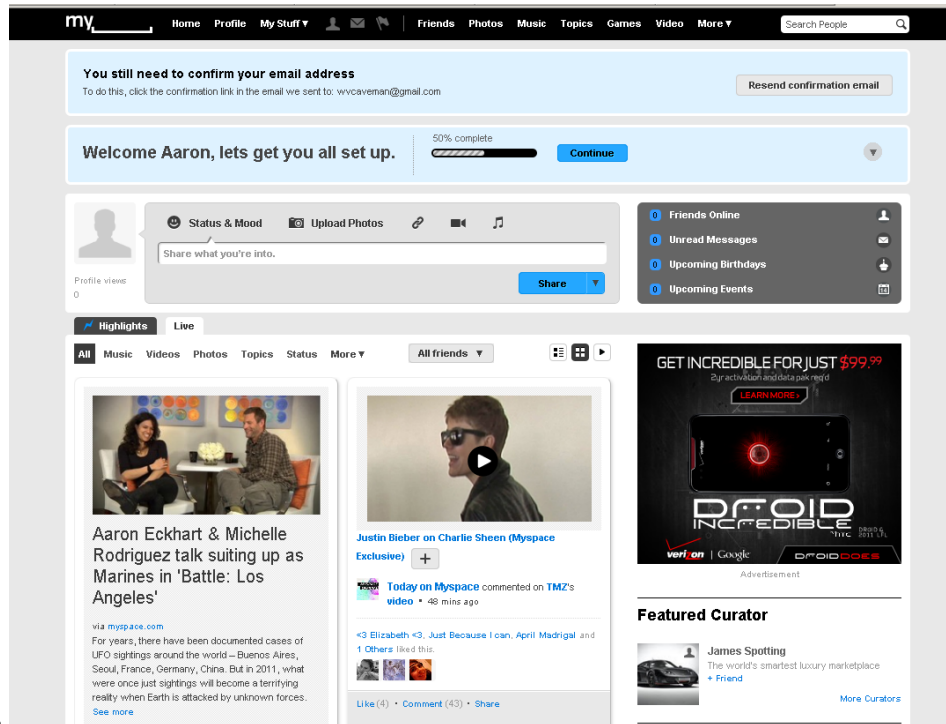
on entertainers' sites.

Figure 1. MySpace login page.

MySpace, like Facebook and Twitter, has seen significant attention in the news media. In 2007, MySpace was reported to have received its 100-millionth user. This news was preceded by the purchase of MySpace in 2005 for $580 million dollars in cash for stock (Young, 2005). At the time, MySpace was considered a huge sensational media success and remained very popular through 2007 and into 2008. However, the cracks in the mortar had already begun as evidenced by regret from the original founders of MySpace for selling their creation (Lacter, 2005). To make matters worse, MySpace has repeatedly been tied to online encounters that ended tragically (Harrison, 2011; Mack, 2011; and Heil, 2011). These events have resulted in a perception of social media being very risky and dangerous, especially for younger people.

Personal security and privacy issues have been a major issue for MySpace from the beginning. The concept that information could be so rapidly shared was not one that a lot of society had pondered before the introduction of social networking sites. To accept and understand this was a major shift in thinking for many. Previous to MySpace, an individual could share information via email and the telephone. The numbers of people receiving such information was rather limited. However, with the sudden ability to communicate and interact with thousands of other people very quickly, personal information was rapidly disseminated, sometimes by choice, but often not (Poulsen, 2008). MySpace has responded to these events over time by increasing and improving security, as well as by making security settings easier to use, although some are skeptical that the efforts are too little, too late (Gannes, 2010).

As the first large social networking site, MySpace has been studied extensively in the peer-reviewed literature including demographics, perceptions of trust and privacy, and impacts of social media on forming connections. MySpace users, at least through 2007, were reported to be younger women (14 to 20 years of age) and men older than 21 (Caverlee and Webb, 2008). Caverlee and Webb found that private profile usage had increased over time, with significantly more females privatizing their accounts than males. Thelwall (2008) agreed with the previous authors' results, finding that the typical MySpace

user is around 21 years old, is female, and is single.

Hinduja and Patchin (2008) optimistically describe MySpace through reference as a social media location where adolescents can learn and refine the ability to exercise self control and develop normative communication. Hinduja and Patchin conclude that, overall, youth are using MySpace responsibly. This is likely due to the fact that MySpace and other social networking sites allow people to find others with similar interests and demographics. This is referred to as homophily.

Thelwall (2009) studied homophily prevalence and reported finding correlation in ethnic background, age, religion, sexual orientation, country, marital status, and attitudes toward children. In short, MySpace users sought out people with similarities to themselves. Thelwall also found that homophily online through MySpace did not necessarily translate to homophily offline, i.e. in the physical world. One reason may be that it is much harder to maintain relationships, at any level, over physical distances than it is through internet communications.

On February 24, 2011, it was announced that MySpace is again for sale (Reuters, 2011). Few headlines picked up on this bit of news and there is no indication in the media what the asking price may be. Considering that the numbers of MySpace users are decreasing drastically, that it is a recreational site, and that it is tied to numerous negative news articles, MySpace will likely not occupy a significant place in social media in the future. A character in a glib, but telling, YouTube (www.youtube.com) video from January of 2010 sums this condition up by saying: "MySpace pages are like the Dead Sea Scrolls of the internet" (Faure-Brac, 2010).

Facebook

When people hear the term 'social network', many surely think of Facebook (www.facebook.com). This is likely because Facebook is extremely popular as a social networking site and there is a movie of the same name that recently won three Oscars (Protalinski, 2011). Mark Zuckerberg and his associates started Facebook at Harvard University in 2003. At first, it was limited to college campuses in the Eastern US and Britain, which made it very popular among college-aged people. However, by 2006 it was made available to all college campuses and then to individuals everywhere (Dwyer et al., 2007). Within weeks of its start, Facebook had over a million users. It would be only five more years until Facebook would overtake MySpace as the predominant social networking site, passing 115 million users in April of 2008 (Arrington, 2008). Worldwide, Facebook now claims to have over 500 million users (Facebook, 2011) and there are some unconfirmed estimates that the site has over 600 million users.

One of the key features of Facebook is that it is relatively simple to use, particularly in its default settings. When logging into Facebook, users are placed into a web page displaying news feeds or one of several status feeds posted by "friends." The information on this page could be most-recent posts, status updates, photos, and links to web pages, other pages within Facebook, videos, or informational posts from customized sets of "friends." Users may also post their statuses, photos, posts, links, etc., but they should be aware that the default privacy setting allows everyone on Facebook to see this information. It is easy to change the privacy settings by selecting Account > Privacy Settings and then choosing the desired settings controls from Everyone, Friends of Friends, Friends Only, Recommended, or Custom. Most users have some level privacy, while many have strict controls in place.
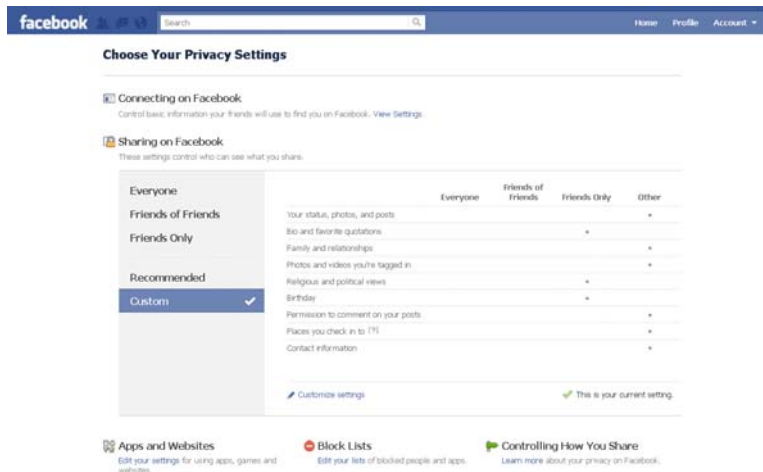
Figure 2. Facebook privacy settings.

The Facebook page layout consists of three columns. The left-most column contains information about the user. The center column is the location for news feeds and status posts. The right-most column contains a variety of items including sponsored links, requests, and events. Default Facebook pages are very simple in appearance. They have a blue border across the top, a white background, and a variety of black, blue, and grey fonts for the text. There are a number of web services that provide browser plug-in for customizing and personalizing users' views of their Facebook backgrounds.

Figure 3. Facebook main page.

Facebook was originally intended for people to simply be social. This is still the primary use of Facebook. Users and their friends can comment on and "like" statuses, posts, photos, and other contributions. However, Facebook has evolved into more than this since its start. There is still a focus on social communication. However, many businesses have recognized the opportunity to keep current and potential customers engaged (Murphy, 2011). Some business entities create conditions for Facebook users to "like" their commercial sites. Some provide coupons to those who visit and "like" their sites, while others provide information through posts about their services, products, and expertise. One benefit of social media over communication tools like e-mail is that users have to login and engage with the media, which means the users are essentially a captive audience. E-mail is still considered to be an important way to

create sales, however, a huge number of e-mail messages must be sent out to get back just a few sales. Potential customers who engage on their own can create conditions for brand loyalty.

Like MySpace, Facebook has seen a great deal of attention from researchers investigating the multiple facets of social networking sites. Facebook has seen its share of privacy concerns, although in a comparison with MySpace, users felt that Facebook provided more privacy. Further, users were more likely to believe that the information posted by others was not embellished (Dwyer et al., 2007). This study also showed that Facebook participants revealed more information than MySpace users, but that the latter developed relationships more readily. The data for this study were collected in 2006 when MySpace was well developed and heavily populated, but when Facebook was still limited to college campuses. As a result, there is likely a difference in the demographic makeup of the two sites from this time.

The use of social media in workplaces has been studied by Skeels and Grudin (2009). Their work focused on Microsoft employee's use of social media, primarily Facebook and LinkedIn. Data appear to have been collected in late 2008 through early 2009. The authors found that over 80% of participants in their study had used at least one of the social networking sites. 13% had heard of it, but not used it, and 5% had not heard of social media services. Facebook led all other sites in numbers of users and posting frequency. The authors were surprised, however, to see how popular LinkedIn was among Microsoft employees. Among college-aged students in the UK, Facebook is perceived to be primarily for social purposes and not for teaching (Madge et al., 2009), or through extension, work-related activities. The authors of that work recommend against using Facebook as a means for engaging with students.

In another study of university students, (Ellison et al, 2010) report that Facebook users were able to expand relationships to socially relevant levels because of the amount and type of information available to users' friends, which they refer to as a 'social lubricant.' They go on to surmise that Facebook supports the further development of relationships among those who are 'actual' friends at some level, but overall does not readily support development of relationships among those who are not. Kaplan and Haenlein (2010), provide guidance for managers in use of social media within the workplace. Some of their recommendations in summary include: aligning need, interest, and culture with the service; providing clearly defined access; promoting engagement and interest; be real; and be honest. The findings from both of the previous two works (Ellison et al., 2010 and Kaplan and Haenlein, 2010) strongly suggest that Facebook, and other social media by association, is not a replacement for developing relationships beyond superficial levels. Instead, there must also be a connection of some kind established in the non-internet world.

Twitter

Titter is a microblogging site for posting statuses having a maximum of 140 characters. Twitter was first introduced in 2006 with a short message, called a tweet: "just setting up my twitter" (Dorsey, 2006). When Twitter came into being, many were familiar with blogs and the kinds of opinion-based content they were populated with. A relatively small number of people followed blogs, especially the well-written and more entertaining sites, but blogs themselves did not create conditions for promoting large social networks where many could contribute. Twitter, however, did just this by opening the content to anyone who wanted to see it and by limiting each posting to no more than 140 characters.

In the beginning, Twitter was somewhat popular with a relatively small group of followers who collectively posted approximately 20,000 'tweets' each day. As a marketing approach, Twitter placed two large projection screens at the 2007 South by Southwest Interactive Conference to show attendees and Twitter users the status posts related to the conference (Douglas, 2007). Because of this, Twitter usage shot up to 60,000 posts a day. In the three years since, Twitter use has increased tremendously with an

estimated 190 million accounts, although only half of whom tweet regularly. QuantCast (2011) shows a growth in actual unique Twitter users of 58 million in October of 2010 to 88.2 million at the end of January 2011. With the recent "Twitter rebellions," first in Iran (Morozov, 2009), and then successfully in Tunisia, Egypt, and other middle-eastern countries, the numbers of Twitter users in that region and worldwide should be expected to continue to climb (Villareal, 2011).
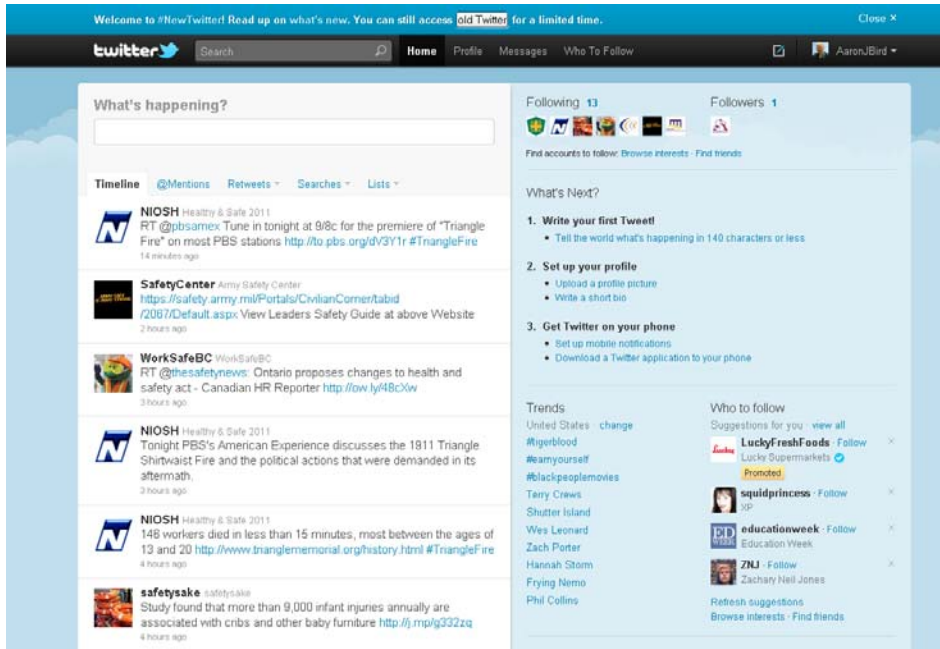

Figure 4. Twitter main page.

Twitter microblogging is accessed in three primary ways. First, through the website Twitter.com; second, through Smartphone apps; and third through short message service (SMS) capabilities on cell phones. Users may elect to login to their Twitter account to microblog and read others' statuses, or they may remain logged in through SMS tweet updates and Smartphone applications. The Twitter display screen is a very simple looking white background with short posts beside names or titles of the posters. First-time users to Twitter may initially be taken aback by what looks like posts containing software coding. In fact, these tweets contain multiple abbreviations to stay within the 140-character limit. The table below shows a few essential components of Tweeting. Twitter provides a glossary with examples to help new users.

Symbol or Abbreviation	Meaning	Example
@	Calls a username and creates a link to that individual or organization.	@BeAMemberofASSE
#	Called a Hashtag. Placing this symbol, that many of us call a pound sign, in front of a word categorizes that word for searching.	#safety is a well-established hashtag.
URL shorteners	Sharing weblinks via Twitter may be one of its most useful applications. However, long URLs will take up all of the available characters. A very common URL shortener is http://tinyurl.com Others are: bit.ly, linkd.in, and fb.me.	http://thehill.com/business-a-lobbying/147441-lobbying-battle-on-tap-over-proposed-changes-to-work-safety-rules This link has 111 characters, but when placed URL shorteners, it is reduced to 26 and 20 characters, respectively. http://tinyurl.com/4pldpk8 http://bit.ly/fiGLoP
d	Lowercase d is short for direct message. In web instance of Twitter, there is a message send/receive location. However, from smart phones, the "d" is placed before a Twitterer's username and the message will go only to them. Limited to 140 characters for privacy. Characters from 141 and up will also be sent, but publicly.	text: d BeAMemberofASSE Private message: Love being a member of ASSE!

If we look at some Tweets from commonly followed organizations, we can begin to decipher the meaning. For example, OMSHR recently posted this, "#FF @NIOSHNoise @NIOSHManuf @NIOSHtransport @NPPTL @CDCemergency @CDCgov." OMSHR is the Twitter username for the National Institute for Occupational Safety Health Office of Mine Safety and Health Research. #FF is short for FollowFriday, which is a hashtag category for status posts related to the day of the week. The remainder of the status post consists of links to various activities within NIOSH, including noise research, the manufacturing and transportation NORA councils, the protective technologies lab, and NIOSH's parent organization, CDC. Tweets do not need all of these elements, but using abbreviations and symbols can help to enhance the amount and quality of information being communicated.

Unlike Facebook and MySpace, Twitter has little in the way of privacy controls. Essentially, there are two categories: public and protected. The protected category allows users to limit access to their profiles and tweets. This category also requires that anyone viewing a user's tweets will have permission to do so. Protected Twitter accounts can be useful, but the primary purpose of Twitter is rapid, public communication. For this reason, Twitter is more suited to business and organizational applications than other social networking sites.

Twitter is commonly used for individual and business marketing and promotion. Twitter sells advertising in the form of promoted tweets and accounts. However, the most effective business use of Twitter is by

maintaining engagement with current and potential customers. Businesses and individuals can team up to more effectively promote their own activities. By "talking up," honestly of course, others sites and activities, then their own activities get attention (Brogan, 2008).

Considering how recently Twitter was created, it is very prevalent in the peer-reviewed literature. In 2007, Java et al. looked at how users interacted with Twitter as well as what they intended to communicate. They found that users most prevalently chat about their current conditions and what they're doing at the time. A smaller percentage used Twitter for conversations, even though the site is not optimal for this. Not surprisingly, many reported using Twitter as a news source.

Twitter is investigated for use in educational applications (Grosseck and Holotescu, 2008) and found to have potential use in collaborative writing, project management, looking at language and colloquialisms, and sharing information during lectures or conference presentations, to name a few. Dunlap and Lowenthal (2009) add rapid student-to-student communication, addressing student issues in a timely manner, writing concisely, and writing for an audience as further educational applications.

To understand the reasons why people use Twitter, Zhao and Rosson (2009) conducted interviews to measure study participants' practices and experiences while at work. Their findings revealed that Twitter is attractive to many because of the rapid delivery of information and the ease of getting the information. The interview participants also revealed that Twitter provided for unscripted "water-cooler" chats, which is beneficial for coworkers to do. It was also apparent that common ground and connectedness were benefits of Twitter use at work, but the authors found that if the Twitter posting was done for broader audiences, then users were less likely to share information. Twitter's use during conferences is discussed by Reinhardt et al. (2009) with those attending conference sessions online being the largest percentage of Twitterers at 50% while those sitting in the conference sessions tweeted at a much lower rate of 9%. The top two reasons cited for tweeting during conferences included sharing resources and communicating, which is supported in a quote by one the study participants: "we discussed things more deeply than the guys on the stage." Finally, Kwak et al. (2010) investigated the collective behavior of Twitter in July of 2009. They found that Twitter is largely a rapid dissemination of headline or persistent news events (over 85%). Furthermore, the found that if a tweet, which is likely a news article, is retweeted just once, then it will reach an average of 1,000 users.

LinkedIn

Of all the social media sites, LinkedIn is the only one focused on individual, business, and organizational promotion for work-related purposes. According to research done among Microsoft corporation employees, LinkedIn was the second most prevalent social media in use (Skeels and Grudin, 2009). LinkedIn currently claims 90 million members, but QuantCast (2011) shows 76 million with about 8.4 million as a maximum per day. QuantCast's data also shows a very interesting trend that is not present in the other social media: LinkedIn is used almost exclusively only during work hours from Monday through Friday. This suggests that users feel good about making use of LinkedIn while on work hours and that they do not feel a need or requirement to interact on the site during non-work hours.
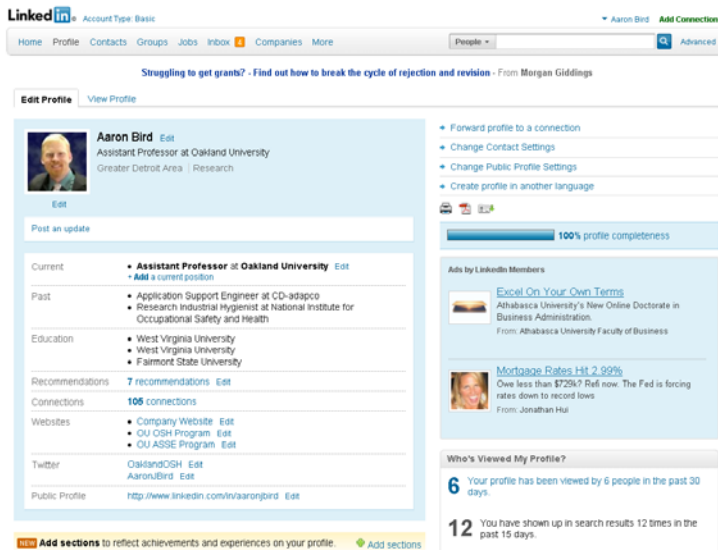
Figure 5. LinkedIn profile page.

All social media have large differences between the numbers of members and those who are interacting with the site. However, in this regard LinkedIn shows enormous differences. This is likely due to LinkedIn being as much of a posting location for resumes and work experiences as it is for actively engaging users. In addition, among comparisons of LinkedIn against other social media, research shows that there are differences in the predominant 'taste ethos' among the users at different times (Papacharissi, 2009). In short, a person may post a status update on Twitter or Facebook that they absolutely would not post on LinkedIn.

Thew (2008) provides specific guidance for effective use of LinkedIn in business networking to recruit job candidates. Thew found that access to viable candidates was easier, as was access to candidates and markets that had previously been more limited. Finally, Gralla and Widman (2008) debate whether LinkedIn or Facebook are better for business. They used the services for evaluating the following: finding a job without the boss knowing, finding information about a job being interviewed for, finding contracts for three-month web projects, soliciting ideas and feedback from team members, getting feedback from outside the company, and keeping track of former associates. The result was a tie. Neither service did better in all of these categories, which is probably not surprising considering that each tool is best suited for different applications.

Social Media in Review

Safety and health professionals can take advantage of the services offered by Facebook, Twitter, and LinkedIn. MySpace is not suitable for work-related applications and thus wouldn't provide much value to safety and health professionals. The keys for success in use of these tools are to take steps to protect one's privacy, especially on Facebook and LinkedIn, and to recognize that only ethical, responsible, and diplomatic communication should be used on these sites.

Smart phones

Smart phones, also called smart devices, are ubiquitous in our society. It is projected that 1 billion people will own smart phones by 2013 (Netzach, 2010). Furthermore, trends show that smart phones will overtake feature phones by the end of 2011 (Middleton, 2010). Smart phones are offered by Motorola, Apple, HTC, T-Mobile, RIM, Symbian, and Samsung to name a few.

Smart phones are considered "smart" because they are more like small hand-held computers than like advanced cell phones. These devices run through the use of an onboard operating system, much like how a computer operates. Some of the providers allow users access too much control of the operating system, like one would expect with a computer. Other providers, however, do not allow access and control the addition of updates and applications.

Smartphone uses for safety and health professionals include using the phone for verbal or text communication, email access, taking photos, writing notes, accessing downloaded or internet-based information, and tracking one's position. Most smart phones provide access to a variety of specific applications.

For example, both the Apple iPhone and the Google Android have a number of safety-related applications. Both of these smart phones have "Safety Talks" applications that provide reminder outlines for safety professionals giving safety talks. Both smart phones also have downloadable health and safety codes, regulations, and safety programs.

Smartphone uses for safety and health professionals could include all of the above, but the simplest and most productive use is quickly sharing information by text, voice, and email with others. The downside of having access to so much information through a Smartphone is the potential increase in work and distractions it may cause. It will be necessary to automate prioritization of communications, especially email, through the use of filters.

e-Learning

Tens of millions of people will be accessing online education in the coming years. Budget cuts, decreases in available travel time, and requirements for just-in-time delivery of products and service means that information must be available as quickly as possible. Safety and health professionals are often attending online webinars and online courses for continuing education and to obtain degrees. Surveys have revealed that approximately 40% of people like e-learning, 40% do not like e-learning, and 20% don't have a preference. It is important upfront to understand what one's preference is.
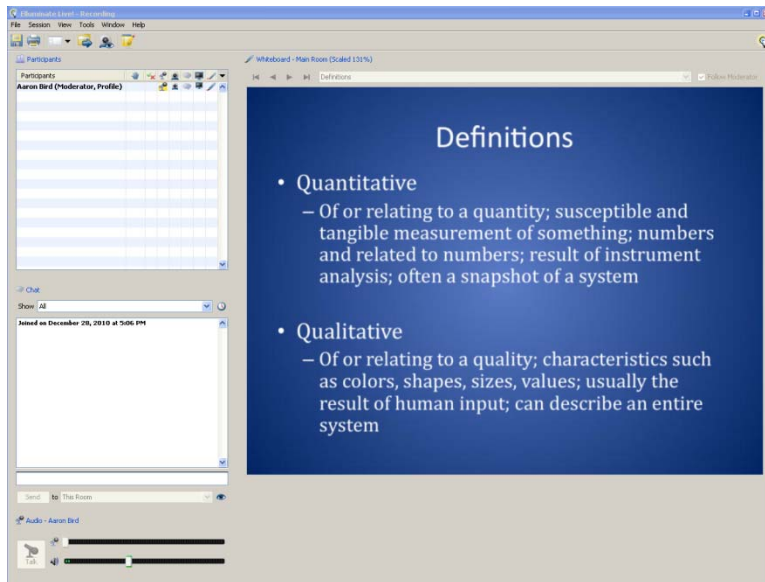
Figure 6. Illuminated live synchronous e-learning tool.

The real key for effective learning or teaching in e-learning is to understand that the internet classroom is nothing like a physical classroom. Regardless of where learning takes place, engagement is critical. In a physical classroom setting, teachers can assess whether students 'are getting it' and can react to the conditions. Participants can ask questions to gain a better understanding. This happens in real time.

For e-learning, however, these connections that many have grown to rely on may not be present in the same form. If e-learning is via synchronous (in real-time) web delivery through a tool like Webex or Illuminated, then students can interact with instructors through messaging, voice communications, and video. Asynchronous delivery, however, puts a great deal of the burden of learning on the student.

Take Aways

Safety professionals can effectively use social media, smart phones, and e-learning for enhancing their work and more fully enjoying their e-leisure time. Here are the critical elements to keep in mind:

- privacy: if it's on the web, others could eventually get to it, so protect it;

- decency: people's feelings, even bosses', are easily hurt, so be thoughtful and careful with what you share;

- property: work-related information in the public domain is the same as lost property, which could be lost revenue;

- enhancing: internet-based services are essential for effective problem solving;

- communicating: no work gets done without communication;

- honesty: communications not done face to face may be suspect, however, with consistent and continuously honest communication, online credibility is built;

- continuous learning: effective problem solvers are always learning new information, new ways to tackle problems, and exercising their brains for future challenges.

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