

# **Web 2.0 and Virtual World Technologies: A Growing Impact on IS Education**

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## **ABSTRACT**

Web 2.0 and virtual world technologies are here to stay. Today, our students come to our classroom with a presence on Facebook, the latest concert as a podcast on their MP3 player, and experience playing games in virtual worlds. In some respects, students are more tech-savvy than their Information Systems professors. Research showing the benefits of collaborative learning is being conducted across disciplines. This Special Issue looks at the use of Web 2.0 and virtual world technologies in information systems classes. In this paper, we introduce this Special Issue by discussing the different types of Web 2.0 technologies, looking at how they are used in information systems education, and examining some of the advantages and disadvantages of using them in the classroom. The final section of this paper addresses some future thoughts regarding the use of Web 2.0 technologies in our classes.

**Keywords:** Web 2.0, Virtual world technologies, Wiki, Blog, Podcast, Social networks, Virtual world communities

## **1. INTRODUCTION**

Whether it is a social networking site like Facebook, a video stream delivered via YouTube, or collaborative discussion and document sharing via Google Apps, more people are using Web 2.0 and virtual world technologies in the classroom to communicate, express ideas, and form relationships centered around topical interests. Virtual Worlds immerse participants even deeper in technological realms rife with interaction. Instead of simply building information, people create entire communities comprised of self-built worlds and avatars centered around common interests, learning, or socialization in order to promote information exchange.

With information systems (IS) classrooms quickly filling with the Google/Facebook generation accustomed to being connected to information sources and social networks all the time and in many forms, how can we best use these technologies to transform, supplement, or even supplant current pedagogical practices? Will holding office hours in a chat room make a difference? What about creating collaborative Web content with Wikis? How about demonstrations of complex concepts in a Virtual World so students can experiment endlessly? In this JISE special issue, we will explore these questions and more.

## **2. TYPES OF WEB 2.0 TECHNOLOGIES**

Web 2.0 technologies encompass a variety of different meanings that include an increased emphasis on user generated content, data and content sharing, collaborative effort, new ways of interacting with Web-based applications, and the use of the Web as a social platform for generating, repositioning and consuming content. The beginnings of the shared content nature of Web 2.0 appeared in 1980 in Tim Berners-Lee's prototype Web software. However, the content sharing aspects of the Web were lost in the original rollout, and did not reappear until Ward Cunningham wrote the first wiki in 1994-1995. Blogs, another early part of the Web 2.0 phenomenon, were sufficiently developed to gain the name weblogs in 1997 (Franklin & van Harmelen, 2007). The first use of the term Web 2.0 was in 2004 (Graham, 2005; O'Reilly, 2005a; O'Reilly, 2005b)

"Web 2.0" refers to a perceived second generation of Web development and design that facilitates communications and secures information sharing, interoperability, and collaboration on the World Wide Web. Web 2.0 concepts have led to the development and evolution of Web-based communities, hosted services, and applications; such as social-networking sites, video-sharing sites, wikis, blogs, and folksonomies" (Web 2.0, 2009). The emphasis on user

participation - also known as the "Read/Write" Web - characterizes most people's definitions of Web 2.0.

There are many types of Web 2.0 technologies and new offerings appear almost daily. The following are some basic categories in which we can classify most Web 2.0 offerings.

**2.1 Wikis**

A "wiki" is a collection of Web pages designed to enable anyone with access to contribute or modify content, using a simplified markup language, and is often used to create collaborative Websites. (Wiki, 2009). One of the best known wikis is Wikipedia. Wikis can be used in education to facilitate knowledge systems powered by students (Raman, Ryan, & Olfman, 2005).

**2.2 Blogs**

A blog (weblog) is a type of Website, usually maintained by an individual with regular commentary entries, event descriptions, or other material such as graphics or video. One example of the use of blogs in education is the use of question blogging, a type of blog that answers questions. Moreover, these questions and discussions can be a collaborative endeavor among instructors and students. Wagner (2003) addressed using blogs in education by publishing learning logs.

**2.3 Podcasts**

A podcast is a digital media file, usually digital audio or video that is freely available for download from the Internet using software that can handle RSS feeds (Podcast, 2009). The file can then be played on a personal computer or mobile device at the listener's convenience. The digital media file may be audio, audio enhanced with graphics (quite often with slides from a PPT presentation), or full video. YouTube is currently the most popular site to post and see podcasts.

There are three kinds of podcasts. An audio podcast is usually an MP3 file and is the most common type of podcast. Enhanced podcasts can have images to go along with the audio. They can also have chapter markers, making it easier to skip to different portions of an episode. Enhanced podcasts may be an AAC file and not supported by all devices. Video podcasts (VodCasts) are movies, complete with sound. Video podcasts can be in a variety of formats, but MPEG-4 is the most popular. As with many Web 2.0 technologies compatibility can be a challenge, but software such as DoubleTwist (2009) works on these issues.

One of the reasons for the popularity of podcasts is that they can be played using laptop computers, iPods, PDAs, mobile phones, MP3 players, or other portable devices.

**2.4 Social Networks**

A social network is a social structure made of nodes, generally individuals or organizations, which are connected by one or more specific types of interdependency (Social Networks, 2009). Facebook, with more than 200 million active users (Facebook, 2009), and MySpace are the two largest social networks.

Twitter is a combined social network and micro-blog service that enables its users to send and read messages known as *tweets*. Tweets are text-based messages of up to 140 characters in length (hence the "micro") which are displayed on the user's profile page and delivered to other users who have subscribed to them (known as *followers*)

(Twitter, 2009). Twitter is currently the fastest growing social network.

Table 1 shows statistics for the top 25 social networks for January 2009.

| Rank | Site            | UV         | Monthly Visits | Previous Rank |
|------|-----------------|------------|----------------|---------------|
| 1    | facebook.com    | 68,557,534 | 1,191,373,339  | 2             |
| 2    | myspace.com     | 58,555,800 | 810,153,536    | 1             |
| 3    | twitter.com     | 5,979,052  | 54,218,731     | 22            |
| 4    | fixster.com     | 7,645,423  | 53,389,974     | 16            |
| 5    | linkedin.com    | 11,274,160 | 42,744,438     | 9             |
| 6    | tagged.com      | 4,448,915  | 39,630,927     | 10            |
| 7    | classmates.com  | 17,296,524 | 35,219,210     | 3             |
| 8    | myyearbook.com  | 3,312,898  | 33,121,821     | 4             |
| 9    | livejournal.com | 4,720,720  | 25,221,354     | 6             |
| 10   | imeem.com       | 9,047,491  | 22,993,608     | 13            |
| 11   | reunion.com     | 13,704,990 | 20,278,100     | 11            |
| 12   | ring.com        | 5,673,549  | 19,511,682     | 23            |
| 13   | blackplanet.com | 1,530,329  | 10,173,342     | 7             |
| 14   | bebo.com        | 2,997,929  | 9,849,137      | 5             |
| 15   | hi5.com         | 2,398,323  | 9,416,265      | 8             |
| 16   | yuku.com        | 1,317,551  | 9,358,966      | 21            |
| 17   | cafemom.com     | 1,647,336  | 8,586,261      | 19            |
| 18   | friendster.com  | 1,568,439  | 7,279,050      | 14            |
| 19   | xanga.com       | 1,831,376  | 7,009,577      | 20            |
| 20   | 360.yahoo.com   | 1,499,057  | 5,199,702      | 12            |
| 21   | orkut.com       | 494,464    | 5,081,235      | 15            |
| 22   | urbanchat.com   | 329,041    | 2,961,250      | 24            |
| 23   | fubar.com       | 452,090    | 2,170,315      | 17            |
| 24   | asiantown.net   | 81,245     | 1,118,245      | 25            |
| 25   | tickle.com      | 96,155     | 109,492        | 18            |

**Table 1. Top 25 social Networks, January 2009**  
(Source: Kazeniak, A., 2009)

**2.5 Virtual Worlds**

A Virtual World is a computer simulated environment that enables users to interact with each other without geographical confines. Each user is represented by an avatar. This avatar may be a generic representation assigned to him or her, somewhat resemble the user (e.g., gender, hair color, etc.), or, in more complex Virtual Worlds, be completely customized according to the user's preferences. Within these persistent - the worlds are available 24/7 - simulations, users can explore, socialize, and solve collaborative challenges.

Linden Lab's Second Life (SL) is currently the largest Virtual World with over 15 million accounts registered (Voyager, 2008). In addition to exploring the SL grid or socializing within communities, SL users, or residents, can create and trade virtual property and services with one another. Moreover, SL allows residents to create and shape their own world through the use of prims (primitives), or programmable objects, via the Linden Scripting Language. This makes the world particularly attractive to those who would like to create and test real-world problems (e.g., system stress tests) via simulations within the SL grid. Other virtual worlds include ActiveWorlds and Trinity.

**3. USE OF WEB 2.0 TECHNOLOGIES IN IS EDUCATION**

Web 2.0 technologies are making their way into the IS classroom. IS instructors are finding innovative ways to use the technologies. Snurb's Blog (2005, 2006) discusses the use of Wikis and Blogs in education: The challenge is to use these

and other online teaching technologies to enhance learning and teaching, not just because they're available, (Snurb; Blog, 2005). We cannot stress this enough; Web 2.0 technology use must enhance learning and teaching and not hinder pedagogy.

Many researchers are calling for more work to strengthen the connections we can create between the classroom and technologically savvy culture. Watson et al. (2008) suggests an "open classroom" model using wikis, blogs, and other "open" technologies to create ". . .enduring "knowledge products" that more completely engage the students and provide value to society" (page 75). Figure 1 is a model that shows how the various Web 2.0 technologies can be used in IS education. Let's examine some Web 2.0 technology uses in the classroom.

### 3.1 Wikis

Wikis have their place in IS education. For example, they can be used in project development with peer review, as a group authoring tool, to track a group project, to collect data

for a class project, for class and teacher evaluation, and for tracking research groups. In addition, instructors can use wikis for collaborative curriculum design and for course content authoring. Augar et al. (2004) discuss the use of a wiki to host an icebreaker exercise that is aimed at facilitating interaction among members of online learning groups. Schwartz et al. (2004) discuss the educational uses of wikis, concluding that the full potential is yet to be realized.

Although this list is not all-inclusive, Wikis can be used in the classroom for:

- Knowledge building over the course of a term through the use of versions and groups
- Critically reading, and responding in a constructive and public way, to others' work
- Progressive problem-solving (especially valuable for open-ended problems) and problem redefinition
- Allowing students to learn how to add slight degree of difference and complexity to concepts

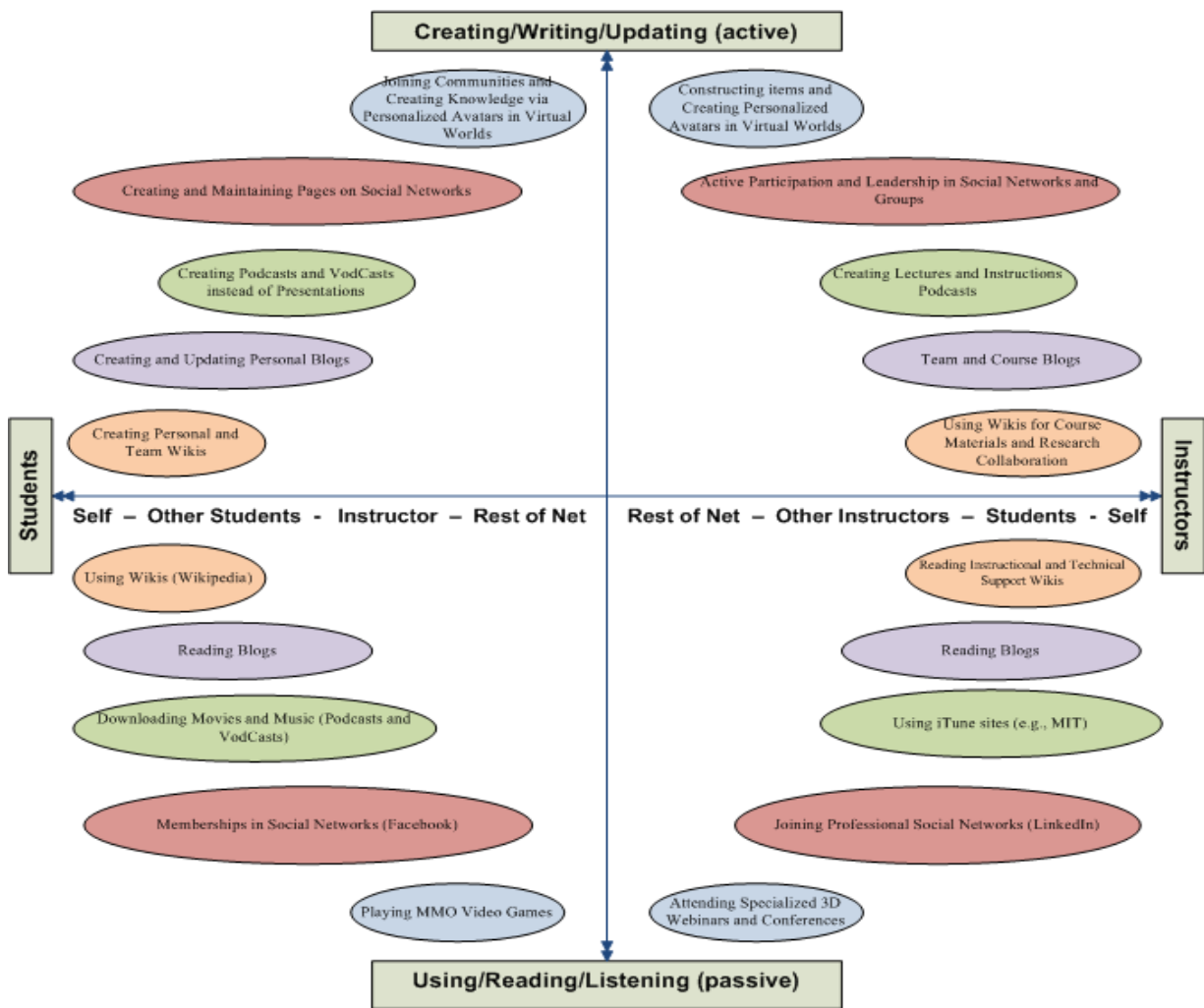


Figure 1. Uses of Web 2.0 Technologies and Virtual Worlds in IS Education (Adapted from Scott, 2003)

- Systematic engagement and analysis with work produced by more advanced students, specialists and experts
- Combining, synthesizing and evaluating definitions and terminology across disciplines
- Questioning underlying causes and principles
- Learning to observe deeply, stereotype less, and avoid premature judgment.

Using Wikis in the IS classroom can be positive for both instructor and student. Some of the positive aspects of Wiki use are:

- They promote collaboration and interaction among students
- They are accessible 24/7
- They work in real time
- The technology is easy to use because it is text-based
- They permit public document construction
- They can promote negotiation.

There are also some negative aspects to using Wikis in the IS classroom. Heather (2004) described an instance where the classroom use of wikis did not work out well. Some of the negative aspects of using Wikis in the classroom include:

- They complicate the evaluation (grading) of writing because the output is usually the result of a group effort and it is difficult to establish who added what to create the final product
- Feedback is public
- Outputs are online and available to everyone.

Wikis do have their place in IS education. It is up to the instructor to learn how to effectively use them.

### **3.2 Blogs**

Like Wikis, Blogs also can have a place in IS education. Baker (2003) discussed the usefulness of learning logs, a forerunner of blogs. Scott (2003) presented a synopsis of how blogs might be used in education. Wagner (2003) discussed how blogs have been used in his class.

Some ways for instructors to use blogs in the IS classroom include (Baker, 2003; Scott, 2003; Bloulos, 2006):

- Networking and personal knowledge sharing
- Instructional tips for students
- Course announcements and readings
- Annotated links for reading or reference
- Knowledge and experience sharing
- Content-related blogs as professional practice.

There are many ways that students benefit when using blogs. Some of these uses include (Bloulos, 2006):

- They allow students to practice reflective writing
- They can be used for assignment submission and review
- They can be used for dialogue for group work
- They can enhance knowledge sharing and knowledge management
- E-portfolios can be created by using blogs (see Zhang et al., 2007)
- Course-related resources can be shared using blogs.

Scott (2003) presents a matrix that outlines some uses of blogs in education using two axes: Students versus Instructors and Reading Blogs versus Writing Blogs.

### **3.3 Podcasts**

One of the most popular uses of podcasts is when a teacher finds a podcast for students to listen to or watch. Whether on a laptop, iPod, mobile phone, or an MP3 player, podcast episodes can be loaded on students' devices so they can view materials at their desks, on field trips, in the library, at a coffee shop, or at home.

Podcasts can be used in online courses as a method of delivering course content to students. Instructors can create podcasts that contain the "lecture" part of an IS class. Knight (2006) notes that podcasts are a great tool with which to supplement classroom lectures, but cautions that they are used by some students to skip class and lectures, so appropriate checks and balances need to be built into instructional approaches.

When deciding whether to use podcasts for instruction, consider some of the advantages:

- Every student has access to the same lecture or presentation
- For a face-to-face class, students who miss class can gain access to the lecture or class content
- They are accessible 24/7
- They can be used to supplement lectures or class presentations.

However, as with any tool, there are some disadvantages with using podcasts in the IS education. These include:

- They are stagnant. Once created, they cannot be changed or modified
- They require high speed Internet access for streaming or downloading
- They are not interactive.

Various forms of podcasts (video tapes, television recordings, etc.) have been used in "distance learning" education for years. We seem to be just now realizing their potential in IS education, both in face-to-face and online environments.

### **3.4 Social Networks**

Whether it's Facebook, LinkedIn, or Twitter, social networks are quickly becoming the norm and must be addressed and utilized in IS education. Reuben (2008) argues that there is great potential in education for Facebook and YouTube, but higher education has not yet found the right niche for Twitter. Although instructors in all disciplines are finding clips on YouTube and using them in their classes, not many have developed Facebook sites or Tweet students on a regular basis.

We agree that more research needs to be done in this area. Fortunately, this issue includes research on these very issues. We'll discuss this in greater detail in Section 5.

### **3.5 Virtual Worlds**

Virtual World (VW) usage within the educational context has grown slowly, but steadily since the early 2000s. However, since 2007, educators' use of Second Life (SL) in particular, has grown exponentially. The NMC's Annual Survey response rate increased over 170% between 2007 and 2008 (NMC, 2008). More interestingly, the NMC found educators primarily exploring and using existing SL areas in 2007 (NMC, 2007) but most transitioning into creating their own virtual spaces in less than a year's time (NMC, 2008).

This increase in VW usage can, of course, be influenced by the Second Life saturation, as well as its ease of use and strong community support. While there are still technical challenges, such as bandwidth and computing power (on the user side), the strong desire for collaboration and communication brought on by the Web 2.0 wave is truly bringing more educators to the SL shore.

With its open-ended nature, SL allows for constructivist learning to take hold (Antonacci & Modares, 2005). Students and instructors can work together to brainstorm solutions to challenges, as well as create the very solutions and test them within a virtual world economy. This socialization and collaboration aspect keeps students interested and motivated, and Linden Labs has provided the tools and the framework to foster this interaction (Bartle, 2004).

Of course, as with the other technologies noted in our discussion, there are advantages and disadvantages to using Virtual Worlds (Dickey, 2003). Some of the advantages are:

- Ability to collaborate within the virtual world
- Accessible 24/7
- Demonstrate simulations not available in a regular classroom
- Allow students to apply skills and knowledge to model solutions
- Provide a larger community within which students can learn from others.

There are, of course, challenges to effectively using Virtual Worlds in education:

- High technical requirements for computer systems
- Steep learning curve to control avatars in virtual worlds
- Potential for harassment, humiliation, victimization, or other distractions
- Lack of environmental control unless situated in a private area.

Still, most agree that using Virtual Worlds to some extent will help prepare students for the world within which they will need to effectively interact and that it is well worth the effort to allow students to experience, create, and collaborate in these virtual spaces (Wagner, 2008). Moreover, whether it is Second Life or other VW communities, such as ActiveWorlds (2009), Gartner Group estimates that over 80% of Internet users will have one or more avatars that they use on a regular basis by 2011 (Gartner, 2007). We, as educators, must be prepared.

#### **4. ADVANTAGES AND DISADVANTAGES IN USING WEB 2.0 TECHNOLOGIES IN THE IS CLASSROOM**

In looking at the use of Web 2.0 technologies in the classroom, we need to be aware of some of the advantages and disadvantages of using Web 2.0 technologies in an IS class. In this section, we will not look at any one technology, but at the bigger picture.

##### **4.1 Advantages**

We start with the advantages of using Web 2.0 technologies in the IS classroom.

**4.1.1 Students Become Part of the Lesson:** When Web 2.0 technologies are used in an IS class, students become part of the lesson. They have the opportunity (or requirement) to be

an active part of the class. Active participation means they add to the wiki or blog, create a presence on a social network, or become a participant in a virtual world. All of these Web 2.0 technologies can engage the students and allow them to contribute to the lesson in an active manner, thus becoming a part of the lesson.

**4.1.2 The World Becomes the Classroom:** The best way to learn is to become active. Web 2.0 technologies expand the classroom to the virtual world and allow the world to become the classroom. Because of easy access to the virtual world, the lesson can be open to anyone; it is not confined to a single classroom or a single set of students. This allows students to easily work across boundaries with others who may have different cultures, values, and interests. It is imperative that today's students have a more global perspective and Web 2.0 technologies can help to this.

##### **4.1.3 Collaboration and Competition Increases Learning:**

There is a large body of research that has documented the beneficial effects of collaborative learning for college students (see Gokhale, 1995; Nowak, et al., 1996; Galagan, 2009). Competition also provides the opportunity for students to learn and widen their knowledge base. Most Web 2.0 technologies have aspects of collaboration and competition. They allow students to work together, or to compete with one another on projects. When Web 2.0 and virtual world technologies are used for collaboration and competition in the classroom, learning can increase.

**4.1.4 The Classroom is Available 24/7:** All of the Web 2.0 technologies are Internet based. This means they are available to students 24 hours a day, 7 days a week. A student simply needs an Internet connection and he/she can be in the classroom. As a result, students can interact in a classroom environment when they are best prepared.

##### **4.2 Disadvantages**

We must also look at some of the disadvantages of Web 2.0 technologies.

**4.2.1 Computing Resources Must Be Available:** Not every student has access to computing resources that are connected to the Internet when off campus. This could be a major disadvantage for students who cannot afford or does not have access to a computer or an Internet connection. This is mitigated somewhat by students using friends' or roommates' computers, cybercafés, or school resources (all night labs, for instance) to connect if computing resources are not available where they live.

**4.2.2 Web Resources Can Be Vandalized or Sabotaged:** Online access is wonderful, but it can be like leaving your valuables on a table in your front yard. Anyone can see your work. If non class members have access to the wiki or virtual world, they can disrupt (a.k.a., grief) the class or cause damage (sabotage) to the environment.

**4.2.3 Plagiarism:** Plagiarism is very easy in the online world; just copy the paragraph or sentence from the source and paste it to the blog or wiki. This can be a quick response to a question or assignment that results in plagiarism.

Students need to be explicitly cautioned about plagiarism when using Web 2.0 technologies in the classroom. Sometimes a quick Google demonstration to see how easy it is for an instructor to locate "lifted" passages is an adequate deterrent.

**4.2.4 Levels of Openness:** Some students are very apprehensive about the openness of Web 2.0 technologies. Written assignments and responses are no longer just between the professor and student, but available for anyone to see and evaluate. This openness causes extreme discomfort for some students.

We have discussed some of the advantages and disadvantages of using Web 2.0 technologies in an IS class. These are but a few; we are sure that there are others. The bottom line is the increased learning that can take place in the IS class if the Web 2.0 technologies are used correctly. Therefore, we must proceed, but from an informed standpoint so that we may balance technology and pedagogy. The articles presented in this special issue are an excellent guide to help in this journey.

## 5. ISSUE OVERVIEW

In this special issue, we have an excellent selection of articles encompassing many aspects of Web 2.0 and Virtual World technologies. When the original Call for Papers was solicited, we cast wide nets soliciting papers for diverse topics concerning Web 2.0 and Virtual World topics. We were not disappointed with the results.

In total we received over 35 papers for this issue. We used the standard double (and sometimes triple) blind review process. Once the submissions were narrowed, they went through two additional review exchanges to hone arguments. From this, we present you with the final results: two Teaching Tips and ten papers discussing various issues, research studies, and implementations of Twitter, Wikis, and Second Life simulations, to name a few.

We begin this issue with a Teaching Tip that deals with an issue many of us face: managing a large lecture section with a number of assistant-driven lab sessions comprised of introductory computing students. Rienzo and Han look to Web 2.0 collaboration technology for the answers. After a brief overview comparing Google's and Microsoft's online office management features, they present their advice on how to use Web 2.0 to manage multiple schedules and grading rubrics in such a large course. Even with multiple students, it is possible to connect with them individually via Web 2.0 communication tools such as Twitter, as Dunlap and Lowenthal note in our second Teaching Tip. Their Teaching Tip guides us through how to best use this new technology to Tweet students in order to establish connections and enhance social presence between students and instructors to foster a positive learning community.

In our first full paper in the issue, Braender, Kapp, and Yeras outline an innovative Web 2.0 Wordpress-driven blog designed to help students wrestle with the many social, legal, and ethical issues surrounding technology usage. The authors provide rationale, planning, and schematics in order to help us replicate their success with this new Web 2.0 offering. The next paper continues not only the Web 2.0 theme but

also the instructional approach. Pollacia and McCallister explain to us how we can effectively incorporate Web 2.0 technologies into our own Learning Management Systems (LMS), such as Blackboard, by evaluating our offerings using Quality Matters™ standards. The authors take us through their process with accompanying examples to help us all offer more interactive and engaging courses within many of our existing technology frameworks. In our next paper, Williams and Chinn implement applied active learning principles to bring an interdisciplinary class project to life. Using an assortment of Web 2.0 technologies, such as blogs and Facebook, the authors enable sports management students to experience the networking and communicative powers of Web 2.0 with a viral marketing assignment.

Many of our papers in this issue look for ways to extend the classroom beyond four walls. Still, we need to examine the pragmatic concerns of whether or not Web 2.0 can make a difference. Li and Pitts address an issue that we all have struggled with at some point or another: making office hours significant and valuable for our students. In this paper, the authors study whether holding virtual office hours within one of the most popular Web 2.0 offerings, Facebook, makes a significant difference both in student-faculty interaction and course satisfaction. Continuing with the critical study of Web 2.0, our final paper in this vein examines the effectiveness of Wikis in our courses. Basing their study within constructivism and engagement theory, Hazari, North, and Moreland put forth a measurement they label the "PVW" (pedagogical value of wikis) to determine how we can effectively utilize this powerful collaborative technology in our courses.

In the second half of this special issue, we move from Web 2.0 to virtual worlds. In the next five papers, we are transported from the physical to the virtual realm as authors discuss the myriad of ways that a virtual world can be used to supplement, or perhaps supplant, the physical classroom environment. However, before moving into a virtual world, we must know what type best fits our needs. Robbins and Butler's discussion helps us make this decision taking into account not only our own pedagogical underpinnings but also our intended teaching goal. The authors put forth a theoretical and practical framework to assist us as we embark into virtual realms so that we are aware of the myriad of possibilities that await us. Our next paper demonstrates just what can be accomplished within a specific virtual world, Linden Lab's Second Life (SL). Dreher, Reiners, Dreher, and Dreher make a strong case for blending the virtual and the physical to motivate students and allow them to practice skills and apply knowledge that can be transferred to real-world contexts without the associated cost. Through a series of examples from complete bottling plants to robust project management endeavors, the authors demonstrate just how constructivist pedagogies can shine within virtual worlds. No matter how useful a virtual world might be, without positive student perceptions in terms of its perceived ease of use, students will not interact with the virtual world to its full extent. Shen and Eder examine this very question in their paper as it relates to studies of student use of Second Life in upper-level MIS courses. After an examination of their findings, the authors discuss implications we must consider as we move to adopt virtual worlds as part of our teaching toolkit.

However, using virtual worlds does not come easily. Discussing their research and findings over multi-year field trials, Wang and Braman help us understand the benefits and challenges of extending classroom instruction via Second Life. The authors explain how they have used this virtual world technology in a diverse range of implementations - from simple virtual tours to advanced programming language instruction - that culminate in an extended case study which implements their pedagogy in an introductory IS course. Finally, we conclude this special issue with a pilot study of Second Life in a senior IS project management course. In this study - based on a Teaching Tip in a prior issue (Wagner, 2008) - Wagner and Ip explore how action learning principles are readily implemented and expressed within a virtual world through a series of senior projects. The authors' findings suggest that students are able to undertake more complex projects with a better success rate in virtual worlds than if they to conduct similar projects in the real world.

We want to thank all the authors and reviewers who submitted and contributed to this special issue. The intense interest in the areas of Web 2.0 and virtual world technologies demonstrates that there is a need for IS educators to examine and experiment how all of these technologies can, or cannot, be used effectively in the classroom and beyond. Hopefully, this special issue will bring more researchers and practitioners into the ongoing discussions about these technologies.

## **6. WHAT IS THE FUTURE FOR WEB 2.0 IN THE IS CLASSROOM?**

As illustrated in our discussion, there are many innovative uses of Web 2.0 technologies in IS education. We see Web 2.0 technologies, such as blogs, wikis, podcasts, social networks, and virtual worlds becoming a standard component of the classroom environment. Students will expect their learning to mirror their interactive lives. As more Generation Y or Millennial (those born between the mid 1980s to the early 1990s) students come to the classroom, they will be connected. They will have a presence on Facebook. They will listen to podcasts on their MP3 players. They will play games with and against others whom they will never see in person. This intertwined information environment is becoming a trademark of this generation (Generation Y, 2009).

Moreover, the increased use of Virtual Worlds for entertainment, socializing, and education will continue to grow (NMC, 2007a). With more users acclimating to a combined virtual and physical life, educators will also need to find ways to bring these technologies into pedagogies to keep instruction relevant and applicable to the world our students are used to and will inhabit after graduation.

However, simply adopting a technology and not truly understanding its potential will not suffice. We must work to improve our research in the area of Web 2.0 (Rollett et al., 2007) and Virtual World technologies. Without it, we will be using old technologies in a 21<sup>st</sup> century world. Students will realize it because they will be ahead of us.

We emphasize again that IS educators must figure out how to use Web 2.0 and Virtual World technologies to increase learning. Web 2.0 and Virtual World technologies are making an impact on IS education. Our students are

already savvy with the technologies. Our hope is that IS professors learn to harness the capabilities to engage students and promote active learning. We have to understand the advantages and disadvantages of the technologies and use them to our advantage.

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