

## Web 2.0 Technologies in Higher Education Teaching: A Practical Introduction

Susan Berg, Wright State University

### ABSTRACT

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Web 2.0 tools are websites that are interactive, allowing users not only to read information but also to create products and interact with others. These tools offer new opportunities for designing instruction for heightened student engagement, particularly with “digital natives.” Yet often faculty are unaware of what these tools can do, are uncertain of how to use them, and leery of the time required to design instruction incorporating them. This paper is a very practical introduction to using common Web 2.0 tools including wikis, blogs, and social bookmarking sites. Sample assignments developed and used by the author or described in the literature are described. These assignments are adaptable for use in a variety of disciplines. Wikis are very useful for group work. Blogs can be used effectively for journals and independent studies. Social bookmarking can enhance organization and sharing of professional web resources. Specific tips for setting up and working with the sites are given as well as recommended resources including handouts and videos that introduce the sites. Other types of Web 2.0/social networking sites with promise for use in higher education, such as multimedia production sites, are briefly described and specific sites recommended. Faculty members are encouraged to start with one simple assignment and then expand.

**Keywords:** Web 2.0 Technologies, Higher Education Teaching, Interactive Websites

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The Internet contains a lot of information. In addition, it provides a platform to connect, create and share. Web 2.0 tools are websites that are interactive, allowing users not only to read information but also to generate products and interact with others. They offer outstanding new opportunities for increasing student engagement in learning. Yet faculty are often unaware of what these tools can do, are uncertain of how to use them, and leery of the time required to design instruction incorporating them. This paper is a very practical introduction to using Web 2.0 tools such as wikis, blogs and social bookmarking sites. Sample assignments illustrating how these websites can be used in higher education are described, as well as specific tips for setting up and working with the sites.

### Significance

Our world is changing. Speculation about the impact of the arrival of “digital natives” or “millennials” to the college campus has been underway for some time. (Carlson, 2005). Faculty members observe that students seem to be permanently

attached to electronic devices (computers, iPods and phones), constantly connecting and communicating with others through *Facebook* and other social networking sites. Kress (2003) identified a change from a “page-based” society to a “screen-based” society. We are reading and writing more and more on the screens of our computers or other devices, increasingly viewing not just print communication, but visual art, video, sound and even advertising. The 2008 ECAR survey (Salaway & Caruso, 2008) found that undergraduate students reported spending an average of 19.6 hours online weekly for work, school, or recreational activities. Over 85% of the respondents in this survey reported using social networking sites. Discussion of a shift from the “information age” to the “interaction age” has begun (Brill & Park, 2008; Milne, 2007). Magolda & Platt (2009) argue that Web 2.0 is about a fundamental shift in the relationship between users and data – and between learners and teachers. Thompson (2007) notes that Web 2.0 has vast potential but it’s “reach is yet undetermined.” (p. 4) He speculates that Web 2.0 may turn out to be a disruptive technology “because of its

potential to change the model of higher education from the traditional classroom framework to an asynchronous 24/7 mode.” (p. 4) He challenges institutions of higher learning to transform themselves from “Education 1.0” institutions to become learning centers that meet the changing needs and expectations of their students. If not, he warns, students may go elsewhere. Richardson (2009) suggests, “we are falling more in danger of becoming irrelevant in our students’ lives.... In order to prepare our students for what is without question a future filled with networked learning spaces, we must first experience those environments ourselves.”

### **Student Engagement and Web 2.0**

Brill & Park (2008) examined emerging technologies and their potential for improving student learning through heightened student engagement. In their review of the literature of student engagement, they identified interest, effort, motivation, and time on task as being well-established learning constructs supporting engaged learning. They also identified three themes evident across multiple frameworks of engaged learning. The themes are student responsibility for and ownership of learning, flexible collaboration in groups, and the use of varied and relevant human and non-human resources to support learning. They argued that the emerging technologies of mobile learning, Augmented Reality, Virtual Reality, and ubiquitous learning have promise for enhancing student engagement.

Some instructors have begun to experiment with the use of other emerging technology tools commonly referred to as Web 2.0 applications. The “2.0” refers to the “read/write” web; websites that are interactive, allowing users not only to read information but also to create, interact, and evaluate. They clearly support the constructs and themes of engaged learning. Examples

of these types of websites are wikis, blogs, social bookmarking, and multimedia production tools. With thousands of these new sites available, this paper will focus on some that have special promise for heightening student engagement. Sample student assignments used in my courses as well as applications described in the literature illustrate ways that faculty in many disciplines can use these tools. Tips to help faculty get started are also given.

Web 2.0 tools are designed to enhance collaboration and sharing. They can be used to create authentic assignments with larger audiences for student work. Instead of the professor being the only one to view and give feedback on their work, student work now can be viewed and commented upon by classmates and members of the larger community. Projects can be ongoing and continually revised. Most Web 2.0 tools are free though it is often possible to purchase “premium” level memberships if more control over the products is desired. Examples of premium features might be turning off ads, making the products private, or accessing more templates.

### **Getting Started**

Taking the first step using any new technology often is intimidating to instructors. Faculty should be reassured that it isn’t essential to be an expert. It isn’t necessary to spend huge amounts of time learning all the features of a particular web application. Just figure out the basics and get started. Most Web 2.0 applications have online tutorials that can be used by you and your students. Some websites have e-mail newsletters that let you know about new features and share information about innovative applications. Online “help” is typically available and some sites have e-mail help. When technical problems have come up, I’ve asked the class or an individual student who I have identified as

having good tech skills to try to solve the issue. Students like using the new technologies and are patient with issues that may arise. Using Web 2.0 tools for class assignments seems natural to the digital generation. Older nontraditional college students understand the need to learn to utilize the new tools in order to be competitive in their new careers. All students appreciate the professional appearance of work products created using these new tools.

Start by introducing the basics of the particular type of web 2.0 application (wiki, blog etc.). A good way to do this is to use one of the short videos in the series “In Plain English” from CommonCraft Video. They are available on *YouTube* or for purchase in higher quality video from the CommonCraft website. Great explanatory handouts are available as .pdf files from Educause’s “7 Things You Need to Know” series. In addition most web 2.0 applications have good quality tutorials with specifics about how to use their websites. Develop step-by-step instructions to get students started. Graduate assistants can be very helpful with designing and/or testing these instructions.

### **Web 2.0 Tools, Sample Assignments, and Tips**

#### **Wikis**

Wikis use software that allows for the easy creation and editing of interconnected Web pages. They are based on the concept of the wisdom of the group: bringing the knowledge and ideas of individuals together to create and edit a product. Wikipedia is the classic example of a wiki project. In higher education, wikis are excellent tools for building online communities and doing collaborative work. They can be kept private or shared with the world.

**Sample wiki projects.** In a graduate entry seminar that I teach, the goal is to introduce students to some of the leading thinkers (“Voices”) in their new field. A wiki with a list of Voices was created with links to key websites/blogs for each voice. While students examine the websites and blogs of all Voices, they are assigned particular responsibility for certain individuals. Students create wikipages with basic information about their assigned Voices. They also read the pages created by their classmates and add comments. An example of one class’s wiki can be viewed at <http://edt700w09.wikispaces.com/>.

In a young adult literature (YA) course, students created a bibliography to be used by the new Dayton Regional STEM (Science Technology Engineering and Mathematics) School. I set up the wiki using the 9<sup>th</sup> grade social studies curriculum themes. Students in the YA course contributed titles and information about young adult books relating to these themes. This project had the added value of resulting in a useful product for the new school to draw on for possible assigned or student choice reading. The wiki can be viewed at <http://wsuedt763sp09.wikispaces.com/>.

Villano (2008) describes how an educator at Boston College, Jerry Kane, established “Exam Question Workspace.” Students submit exam questions to a wiki and respond to questions that have been submitted throughout the semester. Kane warns his students that the answers may not be correct and they are responsible for fixing mistakes. Eighty to 90% of his exam questions come from this wiki.

**Tips for using wikis.** As with most Web 2.0 applications, there are a variety of decisions to be made about how your wiki will function. While the options are numerous and appear bewildering at first glance, usually only a few settings are crucial. For example, set up using

“protected” permissions – anyone can view but only members can edit. This will prevent individuals outside your class from making changes. “Invite” students using university e-mail. Remember, a wiki allows for members to edit each other’s work. If you want to be able to assess individual work, ask students to only add information, not edit what others have written and tell them to sign their work using initials or first names. For a more professional product, consider setting up formatting standards or assigning an “art director” for each page to make sure things like fonts, font size and color are consistent. For group assignments, each group can create their own wiki or be responsible for their own pages within a class wiki. These types of assignment make better use of the wiki’s collaborative environment, with students editing each other’s work. It is possible to monitor changes to a wiki using the “recent changes” feature. Edits can include comments about what changes were made. Wikis can be set up to automatically notify you when changes are made. I usually do not enable this feature not wanting potentially hundreds of e-mails. However this could be a useful feature if you are working on a wiki with a limited number of colleagues or need to keep tight control over a product. Sometimes problems do come up. For example, while using Wikispaces, one of my students inadvertently eliminated the directory so there was no way to get at the pages that other students had developed. She was in a panic and I couldn’t figure out how to fix the problem. I e-mailed the problem to their helpdesk and received, within 24 hours, the step-by-step solution in a return e-mail. This same problem came up in another class. Now I know to “lock” the directory page. There are many wiki sites. Some of the most popular include Wikispaces and PBworks (formerly PBwiki – the “PB” is from “as

easy to create as a peanut butter sandwich”). Links to websites are included in Table 1.

### **Blogs**

Blogs are a familiar Web 2.0 technology to most people. Students and faculty can share their thoughts with the wider world or just with their class using easy-to-use blogging websites. Blogs are normally chronological; the latest “post” shows first with links to previous posts. Web links, graphics, polls and multimedia can easily be included. Readers can leave comments. There are many ways to use blogs in college teaching. For example, blogs are very well suited for independent studies, ongoing reading assignments and student journals. Students take pride in the professional appearance of their blog.

Churchill (2008) explored the question “in what ways does a blog environment supplement classroom teaching and lead to an improved learning experience?” (p.179) He used an experimental blog-based environment with post-graduate students. He concluded that, through blogs, a teacher “can create an ambience in which students feel themselves to be important parts of the classroom community and that their needs and opinions are recognized and addressed.” (p.183)

**Sample blog projects.** In a Young Adult Literature course at Wright State University, students are required to read 10 teen books. This is an assignment that has been used for many years. Before web 2.0, students created a large index card for each title including bibliographic information, a synopsis, reflective comments about the book and its possible use/appeal to teens. I read the cards, made a few comments and returned them to the students at the end of the course. Now each student creates a blog and makes weekly posts about their reading. In addition to the information previously on the index card, students enhance their blog

**Table 1: Web 2.0 Sites**

Sites	Type	URL
Wikispaces	Wiki	<a href="http://www.wikispaces.com/">http://www.wikispaces.com/</a>
PBWorks	Wiki	<a href="http://pbworks.com/academic.wiki">http://pbworks.com/academic.wiki</a>
Blogger	Blog	<a href="https://www.blogger.com/start">https://www.blogger.com/start</a>
Edublog	Blog	<a href="http://www.edublogs.org/">http://www.edublogs.org/</a>
Delicious	Social bookmarking	<a href="http://delicious.com/">http://delicious.com/</a>
Diigo	Social bookmarking	<a href="http://www.diigo.com/">http://www.diigo.com/</a>
Google.docs	Productivity tools	<a href="http://www.google.com/google-d-s/intl/en/tour1.html">http://www.google.com/google-d-s/intl/en/tour1.html</a>
Zoho	Productivity tools	<a href="http://www.zoho.com/">http://www.zoho.com/</a>
VoiceThread	Multimedia	<a href="http://voicethread.com/">http://voicethread.com/ - home</a>
Animoto	Multimedia	<a href="http://animoto.com/">http://animoto.com/</a>
Weebly	Website	<a href="http://www.weebly.com/">http://www.weebly.com/</a>
Jimdo	Website	<a href="http://www.jimdo.com/">http://www.jimdo.com/</a>
Mindmeister	Concept maps	<a href="http://www.mindmeister.com/">http://www.mindmeister.com/</a>
Wordle	Word “clouds”	<a href="http://www.wordle.net/">http://www.wordle.net/</a>
Ourstory	Timeline	<a href="http://www.ourstory.com/">http://www.ourstory.com/</a>
Polleverywhere	Polling	<a href="http://www.polleverywhere.com/">http://www.polleverywhere.com/</a>
Library Thing	Organize library	<a href="http://www.librarything.com/">http://www.librarything.com/</a>
Skype	Videoconference	<a href="http://www.skype.com/">http://www.skype.com/</a>
SecondLife	Virtual world	<a href="http://secondlife.com/">http://secondlife.com/</a>
YouTube	Video	<a href="http://www.youtube.com">http://www.youtube.com</a>
YouTube EDU	Video	<a href="http://www.youtube.com/edu">http://www.youtube.com/edu</a>

with graphics of the book jacket, links to the author’s website, and interesting links such as video booktrailers (similar to “coming attractions” at the movies). Students are required to read each other’s blogs and make comments. I also keep a blog and makes weekly comments on student blogs. Critical comments from me are done via personal e-mail rather than publicly on the blog. Blogs are evaluated using a rubric. Blogging software is easy to use and creates a very professional looking product. Students work hard on their posts knowing that their peers will be reading their work as well as their professor. They learn from each other, gaining information about many more teen books through this method. Sometimes students discover that they have read the same book and can dialog about their

reactions. I read the posts before class and refer to them during lectures and discussions.

In internships, students are required to submit weekly journals that are aligned to the standards of their profession and include reflection about their experiences. When this is done using a blog, both the university and site supervisors can easily make comments.

Blogs work very well for independent studies. Students can blog about their reading and research and the professor can see regular progress and make comments.

***Tips for using blogs.*** Give students instructions for setting up their blogs. Similar to wikis, there are many ways to customize blogs but only a few settings are really important. For example when using

Blogger.com, I give students these instructions. Under “Settings” set “Comments” to “Show” and then set “Who Can Comment” to “Only members of this blog.” Under the “Permissions” tab, set “Readers” to “only people I choose.” They will need to invite their classmates to be members of their blogs using university e-mail addresses that you have supplied them. Sometimes I have found issues with the permissions not working as expected (usually students not understanding that they haven’t logged in) and have had to loosen up the permissions. Set things up so you are “following” all the blogs in order to make it easy to access them quickly. The links will show up on your “dashboard” so you can just click on them to access. It is also possible to build-in RSS feeds for notification of blog postings. Besides Blogger (owned by Google), another popular blogging site is *Edublogs* (see Table 1).

### **Social Bookmarking/Tagging**

Another very useful Web 2.0 application for faculty and student use is social bookmarking or tagging. When a useful website is located, faculty typically save it as a “favorite” or “bookmark” the site. The problem comes in when using multiple computers and/or multiple browsers. Where is that bookmark/favorite anyway – on the laptop, at home? On Firefox or Internet Explorer? This problem is solved when the bookmarks are kept on an external server on the web using a social bookmarking site. But the new social bookmarking sites (e.g. Delicious or Diigo, see Table 1) do a lot more than just keeping your websites in one place. They allow you to organize them using “tags” or keywords that allow you to search your saved links. The “social” part of social bookmarking comes in the way you can share bookmarked links with colleagues or students. Diigo even

allows you to virtually highlight and use digital sticky notes with your bookmarking. The sites are simple to use. Often an icon can be placed on your browser bar that you can click on whenever you want to either tag a site or go to your bookmarks page.

**Sample uses.** Faculty who teach similar courses can share links to useful website links by using the Network feature. If you are the only one on campus teaching a particular course, you can network with colleagues across the country (and world).

If you want to collect web links on a particular subject, for example a research interest or a teaching topic, “subscribe” to bookmarks with the relevant tag. Then the site will watch everyone's bookmarks saved with that tag and deliver links to your subscriptions page.

Create a student assignment for creating a group webography using a social bookmarking site.

### **Combining Web 2.0 Tools**

Web 2.0 applications can be combined to create custom teaching tools. Higdon and Topaz (2009) describe their software adaption of Novak’s (1999-2006) Just-in-Time Teaching (JiTT) framework. JiTT methodology seeks to increase student engagement by gathering student responses to assigned reading and using that information to fine-tune lectures and use of class time. It has been used in physics and other disciplines. Higdon and Topaz combine the use of publicly and freely available blogs, wikis and RSS feeds to gather student responses. The night before a face-to-face class, students respond briefly to two discipline-neutral questions. “What is the most difficult part of the material we will discuss in tomorrow’s class?” and “What is the most interesting part of the material? or “How does the material connect to something else you have learned in this field or another field?” (Higdon & Topaz,

2009, p.106) Student responses are graded using a rubric to insure that students give quality responses. The instructor scans the students' responses for common themes and problem areas and then uses this information to adjust classroom instruction.

### Other Useful Web 2.0 Applications

Every day there are more web 2.0 tools that can be used in higher education. Collaborate with colleagues using *Zoho's* online word processing, spreadsheet and presentation tools. When assigning multimedia projects to students, have them develop their project using *VoiceThread* so that their classmates can comment by typing on the keyboard or using a webcam, microphone or even telephone. Students and faculty can create websites using *Weebly* or *Jimdo*, or create multimedia presentations using their digital photos and *Animoto*. Video conferences are free using *Skype*. Hold virtual class meetings or join meetings or professional development on *Second Life*. Do live audience polling using *Polleverywhere*. Create "word clouds" or visual depictions of the relationship between words based on their frequency of use with *Wordle*. *Mindmeister* can be used for collaborative brainstorming and planning projects, creating concept maps or webs. Use *OurStory* to create collaborative timelines including annotations, photos and video. Organize your books and share your library with students and colleagues using *LibraryThing* (and connect with people who, according to the website, have "eerily similar tastes"). Locate videos that can be used in class on *YouTube*. Mixed with the millions of "home movies" there are some very useful "how to" videos and some quite sophisticated presentations and arguments

by world-class thinkers, including Nobel Prize winners. YouTube has a special channel (YouTube EDU) with video from higher education partners including clips from lectures by well-know scholars on a variety of subjects and commencement speeches from individuals including President Obama, Google CEO Eric Schmidt and singer Dolly Parton.

### Keeping Current

The options can begin to feel overwhelming. A great way for faculty to keep up with the emerging web technologies is to regularly check the Educause Learning Initiative's "7 Things You Need to Know About..." webpage. It includes concise, jargon-free explanations of what the latest technology is, how it works and how it relates to teaching and learning. Educause is a nonprofit association with the mission of advancing "higher education through promoting the intelligent use of technology."

Two excellent guides to using Web 2.0 tools in the classroom are books by Richardson (2009) and Kist (2010). While both titles focus on the K-12 classroom, they do present very practical examples of ways to use social media effectively to create deep learning. They also give insight into what kind of prior experiences and expectations your future students may have as then enter college.

The most important thing is not to become overwhelmed by all the options. Start with one simple project, using one web 2.0 website in one course and build from there. The resulting community-building opportunities and heightened student engagement will quickly convince you to do more

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Susan Berg is Assistant Professor, School Library Media Program Educational Leadership, Department Wright State University, Dayton, Ohio.