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Look! Up in Cyberspace! Is it Web 2.0? Is it Web 3.0? No! It's SuperWeb – Technologies for the Classroom!

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Using the familiar Bloom's Taxonomy pyramid, traditionally applied in educational learning objectives, can be useful in helping to choose the right technology to assist in reaching the desired educational outcomes. Many Web technologies provide free or low-cost teaching tools. Some of the many options available for the computer are provided here along with lesson ideas to incorporate these tools into the learning environment.

Introduction

Faster than a speeding bullet, more powerful than a locomotive, able to leap . . . O.K., maybe that may be taking it a bit too far. However, using Web technologies in your classroom might help turn you into Superteacher. Without a doubt, the Web has changed the way most of the world lives. Conole (2010) noted “technologies now infiltrate all aspects of our lives and are recognized as important tools for education,” yet “wide-scale uptake of technologies has not occurred; there is a gap between the promise of technologies and actual practice” (p. 141). In the business classroom, the use of Web 2.0 technologies is important on more than just an educational front. These technologies are not only changing education, but they are also changing the way businesses operate. According to Andriole (2010), when these technologies are properly deployed in the business setting they have the potential to increase productivity and the competitive advantage in a cost effective manner. In using these technologies to improve learning, students are also being prepared to be more successful when they begin their careers.

Web 2.0 or Web 3.0

In 2005, Tim O'Reilly and MediaLive International were credited with coining the term Web 2.0. They used this term to describe the direction of the Web after the dot-com bubble burst that had happened in 2001. At this time there were many who were questioning the validity of the World Wide Web hype. While brainstorming, the participants formulated a list of some of the ways the Web had changed to merit this new 2.0 vision (O'Reilly, 2005). Web 1.0 was considered a repository and library of information. Web 2.0 moved from an environment where information was presented, to an environment where information was exchanged. An emphasis is placed on interactivity and Web user connections (Biring, 2012).

In the intervening seven years since that meeting, change has continued to occur and according to some we are moving past Web 2.0 and approaching Web 3.0 where information will be personalized. In addition, it will utilize comprehensive fields of information in order to enhance the intelligence and accuracy of Web search results. Artificial intelligence will provide users with more useful information than simple keyword searches were able to do (Biring, 2012). Apple iPhone's Siri is an example of having information personalized and provided to the user. Biring (2012) predicts that with Web 4.0 virtual worlds will become very important to the future. She suggests that personal immersive virtual worlds will take the place of blogs or social media.

Technologies for the Classroom

Technology in itself is not a panacea for learning to occur in the classroom. A common saying in the early days of computers was “garbage in, garbage out.” That can also apply to the use of Web technologies in learning. The correct technology to help achieve the learning objectives must be carefully chosen if it is to be successful. In

deciding which technologies – or whether technologies – should be used, the first step should still be the learning objective. Only then can a technology be chosen that will facilitate the desired learning (Bower, Hedberg, & Kuswara, 2010). As educators it is also important that we provide students guidance on using these technologies in an ethical and socially responsible manner (Asselin & Moayeri, 2011).

Bloom’s Taxonomy has both proponents and opponents in regard to its application to all levels of education. Developed by a group of thirty-four educators, psychologists, and school examiners, the intent of Bloom’s



Figure 1: Web 2.0 Pyramid <http://www.usi.edu/distance/bdt.htm>

Taxonomy was to provide a classification system for test questions and was part of a larger three-part system (Booker, 2007). Bloom’s Taxonomy does provide a systematic method for thinking about learning objectives. These guidelines for learning objectives can be very useful when looking at technologies and their application to achieving those objectives. In this graphic, created by Penney, one can see how Web 2.0 technologies can fall into classifications that would help to decide which type of technology could be used for a specific level of learning. It is important to note, however, that these application levels can certainly cross to different levels based on the manner in which the technology is applied to the learning

exercise. In this article the authors will provide Web 2.0 technology resources from each of the six levels of the pyramid and give an example of how it would fit into the classroom.

Remembering

Bloom’s first level, knowledge, is the recall of data or information. In an updated version of Bloom’s, this level is called remembering. There are those who felt the concept of knowledge was done a disservice by placing it at the bottom of the pyramid (Booker, 2007). Wineburg and Schneider (2009/2010) said that, “Placing knowledge at the bottom of the Bloom pyramid sends the wrong message about the importance of knowledge in learning” (p. 56). However, it could also be looked at as the fact that knowledge is the foundation of all of the other levels. Therefore, this placement makes it the most important. An application that would work well for knowledge/remembering learning objectives is the Delicious social bookmarking site.

Exercise Example: <i>Students will work in teams to develop a resource database of sites on assigned topics.</i>	
Site Name: Delicious	Site Address: http://www.delicious.com
The welcome banner to this site reads, “Delicious helps you find cool stuff and collect it for easy sharing. Dig into stacks created by the community, and then build your own.” Delicious is a social media site, which has been around since 2003. Yahoo acquired Delicious in 2005, and in 2011 it changed hands again and now is owned by AVOS Systems (as is the similar site Trunk.ly). Basically, Delicious allows you to save and share bookmarks. A new feature in Delicious is the ability to collaborate on “stacks.” The stack feature allows for joint compilation of content (Delicious, 2012). This would work well for a team or class project to develop knowledge base.	

Understanding

The second level to Bloom’s original taxonomy, comprehension, is about understanding the meaning, interpolation, and interpretation of instructions and problems. Comprehension is being able to state a problem in

one's own words. In the newer version of the taxonomy, it is called understanding. There are many online tools that will assist in comprehension for the student. One of these online tools is called Quizlet, which allows students to create flashcards. A familiar saying credited to famous atomic scientist Frank Oppenheimer is, "The best way to learn is to teach." Students are able to take information and create a tool that can be shared with their classmates.

Exercise Example: *Using the database developed in Delicious, utilize Quizlet to develop flashcards to help your classmates learn the main points of the topic under study.*

Site Name: Quizlet

Site Address: <http://quizlet.com>

Quizlet enables students to use their own terms and definitions to create learning tools and study games. There are various modes that can be used with Quizlet which include:

- Flashcard Mode – study cards with text and/or images for the learner to review
- Speller Mode – audio pronunciation of terms for the learner to type
- Learn Mode – a short-answer system that tracks each attempt and retests wrong answers
- Test Mode – multiple options to check understanding
- Scatter and Space Race – video games to reinforce learning

Using this program, students can translate material into an online format that promotes comprehension for themselves and others.

Applying

The third level to Bloom's original taxonomy was application -- using a concept in a new situation or unprompted use of an abstraction. It is being able to apply what was learned in the classroom into novel situations in the work place. The word was changed to applying in the revised version. Application of knowledge can take on a wide range of interpretations.

Exercise Example: *Students will create a shared Evernote notebook to collaboratively weave together audio, graphics, quotes from literary sources, Webcam shots, and other materials, which can be used as a notebook presentation or as a resource when creating a*

Site Name: Evernote

Site Address: www.evernote.com

Evernote allows compilation and synchronization of materials from a wide array of sources into one space. This takes on new importance in today's media-rich and interconnected society. Students can share information from Evernote with others via Twitter, Facebook, Email, and by a unique URL. What would be a text-only conversation or assignment can be enriched with graphics, audio, and other resources and shared among group members in real-time from a variety of Internet-ready devices. As with many of the other tools, various levels of Bloom's can be addressed using the Evernote program. Evernote has a free version and a "premium" version.

Analyzing

Anderson and Krathwohl (2001) defined Bloom's fourth level as "breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing" (pp. 67-68). Although Bloom was a Behaviorist, the emphasis on higher order and critical thinking skills drew widespread adoption among Constructivists in K-12 education (Booker, 2007). The Constructivist philosophy places emphasis on allowing students to solve real world problems. Tools that make

problem-solving easier are vital to students as they manage more information than any preceding generation has faced. A flow chart or a diagram is basically a way of analyzing complex information and reconstructing it into something more manageable and easier to understand. Gliffy is one of the tools that will facilitate this exercise.

Exercise Example: *Students work in groups to illustrate with Gliffy a complex process or an organization's personnel structure in the form of a diagram, layout, chart, or flowchart.*

Site Name: Gliffy

Site Address: <http://www.gliffy.com>

Gliffy's website touts its application as a way to "easily create professional-quality flowcharts, diagrams, floor plans, technical drawings, and more!" Many times it is difficult to describe in words what can be illustrated in a graphic format. For example, students can more precisely define and present the complexity and hierarchy of an organization through development of a one-page organizational chart.

Evaluating

In the original taxonomy, the fifth level was synthesis. In Penney's pyramid, Bloom's top two levels are reversed to match the revised Bloom's that was developed in the 1990s. This newer version moves Synthesis or creating to the top level. A good way for students to evaluate is to gather data through surveying and then to interpret the results of the data collected. Survey Monkey is a free service that can be used for this purpose.

Exercise Example: *Students will prepare a survey of student opinions on their assigned topic, and survey a prescribed number of participants. Students will then evaluate the results of the survey to report to the class.*

Site Name: Survey Monkey

Site Address: <http://www.surveymonkey.com>

Survey Monkey will allow for free online surveying using a "Basic" account. There is no software to install to use this tool. This account has a limit of ten questions on the survey and allows for 100 responses per survey. The Basic plan also has fewer templates and has no customized themes. However, it still has 15 types of questions just like the paid version. The Select plan has unlimited questions and unlimited responses. However, this version has a cost of \$17 a month billed at \$204 annually. There is also a Gold version that has additional specialized features. Survey Monkey features an easy-to-use interface and a variety of reporting options including the creation of charts of the data collected. Another nice feature of the program is that as soon as a survey is completed, the responses can be viewed and reports generated. This gives the user the ability to get immediate feedback.

Creating

Creating has replaced evaluation at the top of the pyramid in the updated Bloom's Taxonomy. Bloom explained his level of synthesis as the ability to combine extant elements into new forms and patterns, i.e., creativity (Booker, 2007). Students should be both encouraged and provided with support in shifting away from passive learning approaches towards collaborative and interactive approaches (Abedin, 2011). The application Prezi is an excellent way to afford students a creative canvas for individual or collaborative presentations.

Exercise Example: *Students will create a Prezi based on the data collected from the Evernote notebook, Gliffy chart, and Monkey Survey research.*

Site Name: Prezi

Site Address: <http://www.prezi.com>

The company website defines Prezi as, “a cloud-based presentation software that opens up a new world between whiteboards and slides. The zoomable canvas makes it fun to explore ideas and the connections between them. The result: visually captivating presentations that lead your audience down a path of discovery” (prezi.com/about). Instead of buying poster board to create a poster or concept map, students can use this software, which allows them to create non-linear presentations. There is no limit to the creativity they can exhibit. Prezi is free when used as an online version. To be able to work offline on a project, it is necessary to upgrade to their paid version. The “Pro” version price is \$159 a year, but for educators the same version is only \$59 a year. Prezi.com offers video tutorials that are essential for beginners.

Summary

Technology should serve as a platform for promoting collaboration and learning processes. Cifuentes, Xochihua, and Edwards (2011) suggested Web 2.0 technologies “empower instructors to create student-centered environments as never before because read/write tools empower learners to generate, share, and edit course content” (p. 2). However, successful use can only occur when students are engaged in thinking processes that allow that facilitation (Bower, Hedberg, & Kuswara, 2010). It is also important to move beyond using a Web 1.0 mentality to employing the interactive capabilities the “New” Web has to offer whether Web 2.0 or Web 3.0. As stated by Asselin and Moayeri (2011), “The crucial role of schools in the world of the evolving web is not only to use it to engage students and support their learning, but to guide students in ethical and socially responsible use of the increasing complex and global worlds of the web” (p. vi-vii).

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