Web 2.0 has been around for almost 10 years—Blogger (http://www.blogger.com) started in 1999, Wikipedia (http://www.wikipedia.org) in 2001, Facebook (http://www.facebook.com) in 2004 and Youtube (http://www.youtube.com) in 2005. The buzz surrounding Web 2.0 technologies has spread into the education arena, prompting educators like myself to experiment with it for teaching and learning. This article outlines some of the learning experiences I had with some of these Web 2.0 tools, including the use of blogs, wikis, Facebook and Youtube in the context of polytechnic education in Nanyang Polytechnic’s School of Chemical and Life Sciences. A survey was conducted to elicit students’ views on the use of Web 2.0 tools for teaching and learning and the positive feedback garnered has led me to believe that collaborative learning will become a cornerstone in the future of e-learning.

Web 2.0 is defined as the “second generation of the World Wide Web, especially the movement away from solely static webpages to dynamic and shareable content and social networking” (Wiktionary, n.d.). In essence, we are seeing a paradigm shift from Internet users as consumers of information to being the creators of information. This ties in squarely with what we educators are trying to achieve—by getting students into the practice of learning by “doing”, and the shift from teacher-centred to student-centred learning. In addition, there is a social networking component of Web 2.0 technologies which adds a collaborative aspect to learning.

**Blogs**

Blogs first appeared on the Internet in the late 1990s as weblogs and became popular in the earlier part of the 21st century. The allure of blogs stem from the fact that people can use these online platforms to express their opinions or share expert knowledge through online writing. Conversely, readers of blogs can also express their opinions and knowledge by commenting on the blog posts.

I first explored using blogs for teaching in 2005 where I taught the module “Bioprocess Technology”, which incorporates a laboratory exercise in fermentation. Traditionally after the laboratory exercise, students submit a laboratory report detailing the experiment’s objective, the theory behind it, material and methods used as well as the results they garnered and subsequent discussions about the experiment. In that particular year, I got the students to submit the report in the form of a blog.

**Wikis**

Wikis are used for the purpose of collaborative publishing on the web, as exemplified by Wikipedia. Unlike blogs, users of wikis can edit each other’s work and therein lies the key difference between blogs and wikis. In addition, while blogs are more suitable for presenting information in a chronological order, wikis users enjoy greater flexibility in layout, such as being able to present the content in a topical manner.
As educators, we like to tell stories during lectures as a way to engage our students’ interest in the subject. In 2007, I had an idea to get students to tell their own stories with regards to how chemistry informs their daily lives. This was part of the module that I teach in Year 1—“Physical Chemistry”. I also had the idea of compiling all the stories or articles in the form of an e-book using a wiki. The wiki which I used was PBWiki, now known as PBWorks (http://www.pbworks.com). This is a private wiki where editorial access can be limited through passwords, as opposed to a public wiki such as Wikipedia where editing is open to all users. I even conducted a role-play exercise in class, where I took on the role of a publisher requiring students to submit a proposal for their story. This was a way to get them to think of the assignment in advance instead of doing last minute work. It also gave me a better idea of the spread of stories that the students will write and how I would devise my e-book’s layout accordingly. After their story proposals were approved, the students were given a password to enter the wiki, named “Pchembook” (http://pchembook.pbworks.com) to edit its content.

Here are excerpts of some interesting stories by my students:

**The Reaction of the Toto Receipt** (A story about thermal reactions by Lam Li Ling)

“How do you get back the reading on the receipts using thermal paper? Well, if old thermal receipts have faded, they can sometimes be fixed by ironing them…

The heat-sensitive layer where the original letters were desensitized and the faded letter will not re-blacken, but the rest of the receipt will, giving you a negative copy of the receipt.”

**How Does a Whistling Kettle Works** (A story about the kinetic theory of matter by Lim Wei Ling)

“A long time ago, in a village called “Water Reservoir” lived the water molecules. However, this village was cursed by a wicked witch. Therefore, whenever a water tap was turned on, the water molecules would be sucked into a dark mysterious tunnel to an unknown world and be separated from their family and friends forever.”

**How Common Drinks Might Affect Our Teeth** (A home experiment conducted by Neo Say Poh to study the effect soya bean drinks, green tea and other common beverages have on egg shells which have been submerged in these liquids for 12 days)

“…although they are ‘healthy’ drinks, they will still affect our teeth as they are high in protein, sugar, and minerals. Water is still the best drink that can keep our teeth healthy and strong as it contains fluoride that helps to prevent tooth decay”

I was pleasantly surprised by the quality of the stories submitted by many students. The e-book became an excellent introduction to the subject for future chemistry students, allowing them to find meaning in learning chemistry from daily examples in real life.
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Youtube and Facebook

Youtube and Facebook are Web 2.0 websites that have become very popular recently. As of today, 24 hours of videos are added to Youtube every minute (http://www.youtube.com/t/fact_sheet) whereas Facebook boasts of more than 400 million active users (http://www.facebook.com/#!/press/info.php?statistics). Almost every one of my students today has a Facebook account.

Noting the rise of the social networking craze, I started a Facebook group in 2009 and named it “Fans of Chemistry” (http://www.facebook.com/cheeming.ong#!/group.php?gid=72387071524). A Facebook group is a common space that allows Facebook users with common interests to come together to discuss and share resources. I initially wanted to use this group to collect links of chemistry-related videos found on Youtube. However, I expanded the project by assigning students into different groups and getting them to create an original video clip (not longer than 5 minutes) that is related to chemistry.

Figure 3. Screenshot showing the archives of original clips on the Facebook group “Fans of Chemistry”.

For this assignment, students had to first post Youtube videos about chemistry on the Facebook group. Facebook allows users to comment on one another’s posts and users can also vote for a video or post by clicking on the “Like” button. This was a great warm-up activity for the students to find out what is available online. When producing the actual clips, the students could choose to repeat certain experiments or simulations they see on the videos. In addition, they could improvise by providing explanations, doing role play or adding their own storylines to their videos. Although the students are not film or media majors, the quality of the videos they produced is good, considering that most groups used the camera in their mobile phone or a point-and-shoot camera to capture the video, and used primitive software to edit it. The result of this project was a database of over 20 original clips submitted by the various groups; these videos can also serve as teaching resources and future batches of students can continue to contribute to this database. Students also had fun producing the videos in teams and commenting on one another’s work on Facebook.

Survey

A simple survey was conducted for 88 students from the School of Chemical and Life Sciences on their attitudes regarding the use of Web 2.0 tools for teaching and learning. Positive comments concerning the use of these tools include:

- Learning collaboratively
- Learning in an informal setting
- Opportunity to demonstrate creativity
- Opportunity to express themselves through online means
- Learning through visual aids (such as videos)
- Providing variety in learning.

Negative comments concerning the use of these tools include:

- Poorly designed activities
- Activities are time consuming
- Lack of IT skills
- Dislike group work
- Voting on Facebook was more like a popularity contest.

All in all, there were more positive than negative comments about using Web 2.0 tools to enhance teaching and learning. However, educators who intend to utilise Web 2.0 technologies in their teaching have to ensure that the negative comments are addressed. These measures can include designing a good Web 2.0 activity that encourages creativity in the classroom rather than a “copy-and-paste” culture, giving students manageable projects, helping students with weaker IT skills by pairing them with their peers who are stronger in these skills, and spending time facilitating group work and online activities, including moderating comments that the students post online.
Conclusion

I believe that as educators become more skillful in designing and managing Web 2.0 learning activities, the positive benefits of using Web 2.0 in teaching and learning can be maximised. These benefits include more opportunities for students to collaborate, express and showcase their creativity. Student-generated content are also excellent evidence of learning outcomes achieved and the production of potential teaching resources. These benefits are good reasons why I believe collaborative learning through Web 2.0 platforms will become a cornerstone of e-learning in future.

Reference