Supporting 21st Century Learning Through Google Apps

According the 2009 Horizon Report, which "draws on a comprehensive body of published resources, current research and practice" there are "six emerging technologies or practices that are likely to enter mainstream use in learning-focused organizations within three adoption horizons over the next one to five years."

At Adam Scott Collegiate and Vocational Institute (CVI) in Peterborough, Canada, the Learning Commons is the school's central place for introducing new technology to students and teachers. This includes collaborative projects with teachers to develop curriculum that uses new technologies. Over the last few years podcasting as well as other online and video collaborative e-learning tools have all been implemented through the Learning Commons.

Currently, as the teacher-librarian at Adam Scott CVI, I am piloting two new projects--Google Apps and Netbooks. Both pilot projects support the two most important trends in educational technology according to the Horizon Report--cloud computing and portability. These projects had an immediate and significant effect on improving learning for students as well as inspiring teachers to integrate technology in the classroom in order to engage students.

CLOUD COMPUTING & GOOGLE APPS
Google Apps uses the paradigm of cloud computing. Anyone who uses common email systems such as Hotmail or Gmail already uses cloud computing. It does not matter what computer is used to access email because both the program (to run the email system) and the data used by the system (e.g., the text of messages or attachments) are located on an Internet server, which is referred to as the "cloud." The Internet server could be located anywhere in the world, but from the user's point of view, it does not matter where the "cloud" is located.
Google Apps has the most popular applications available as part of their cloud including a word processor as well as spreadsheet and presentation software. All that is needed to use Google Apps is a browser and access to the Internet.

These applications (Word, Excel, PowerPoint, etc.) allow students and teachers to create documents, share calendars, email, chat, create web pages, video, and more. It is secure as everything stays within the registered domain and cannot be accessed by people who do not have a login. It is an excellent tool to provide e-learning. It works on any computer including Macs and many Personal Digital Assistants (PDAs) such as cell phones, iPhones, and netbooks.

There are thousands of schools and millions of students around the world registered for Google Apps Education Edition. These include secondary schools, colleges, and universities including Arizona State University, Trinity College Dublin, and Notre Dame (see www.connectingeducation.com to read case studies):

For instance, Kevin Roberts, chief information officer of Abilene Christian University, reports, "The school dumped its own e-mail program in exchange for Google Apps in 2007…it freed us up to concentrate on classroom applications."

Also, Andrew Stillman, Assistant Principal of Columbia Secondary School says, "Our technology and information systems are a huge selling point for parents [who] may otherwise have doubts [about sending students to our school]."

After all, Google Apps is free for non-profit educational institutions, so it has the potential to save school districts significant amounts of money because Google Apps replaces most of the other software used and much of the physical infrastructure such as school and district servers. This means money can be redirected from IT into the classroom, which can have a significant effect to improve learning:

"Frantic troubleshooting by an overworked staff versus someone else fixing problems smoothly. A sliver of server space per person versus a five-gigabyte chunk. Half a million dollars versus free. That's what colleges are faced with as they decide whether to continue running their own e-mail services or outsource them to a professional service like Google Apps Education Edition" (Carnevale, 2008, p. A1).

"Our project cost one tenth of what it would if done internally" (Paul Duldig, University of Adelaide vice-president of Services and Resources--personal communication, February 2009).

**TYPICAL SCENARIOS THAT ARE SOLVED WITH CLOUD COMPUTING**

When students are using different computer systems and different software between school and home, anything and everything can happen.

• Jason arrives to school with his world issues major essay on a USB key. He tries to open it at school but is unable to because his word processor at home is incompatible with the school's word processor. His essay is due in 20 minutes and Jason cannot get home to print it.

• Maria creates a presentation for her law class on a Macintosh computer at home. Unfortunately all the computers at the school are PCs and she is unable to show her presentation.

• A group presentation is assigned to an English class. In one group, three students have part-time jobs, two students are on the rugby team, and one student is trying to earn her 40 community hours. They are unable to get together after school to work on the group project because of their incompatible calendars.

• You are teaching a Grade 12 history course and the final June essays are due. One of your students comes to you and says that his computer crashed and he lost all his work. He's not sure when he will be able to submit the paper.
Google Apps eliminates all these problems and provides an integrated solution where students have access to their work both at school and at home in a collaborative environment without the worry of losing data. Google Apps helps make the technology easier so students can concentrate on learning.

ADVANTAGES OF CLOUD COMPUTING
Cloud computing is popular because it has many advantages over traditional computer systems where programs are located on a computer's hard drive.

• Software is available for free and it does not have to be installed. Also programs do not have to take up hard drive space on the computer.

• Software versions are automatically updated when new features are added.

• Documents are automatically saved. No more lost documents even if the computer crashes.

• Documents can be shared in real time with other users. Students can easily collaborate for group projects and it also allows the teacher access to students documents while they are working on them.

• Documents can be published as web pages.

• Students can access Google Apps from their cell phones and any device that has access to the Internet.

• Reduces the need to print, because of access to documents at home and on PDAs. This helps the environment and saves schools money.

Another important advantage is that students are using exactly the same computer environment at home and at school. This means students only have to learn one environment and do not have to worry about using different software between school and home. Also students receive free software for home use; this is especially good for presentation and spreadsheet software, which students often do not have at home.

Google Apps provides students with unique tools such as the ability to create online surveys where spreadsheets are automatically updated with data that is collected over the Internet. They can publish any document as a web page, making students "global citizens" and giving them the ability to make global connections. They can access educational Google gadgets and even create their own.

Google also provides a top rated online calendar system. Teachers use their calendar to communicate to students important class dates and extracurricular dates (sports events, club meetings, trips, etc.) Students can also create their own calendar and mesh it with other calendars. Teachers' calendars can be posted as web pages so parents have access to class activity schedules.

Google has created a web site containing lessons and assignments on using Google Apps for different subjects and grade levels. This web site continues to grow as more schools use Google Apps and is building a community of educators who share ideas and resources. (See www.connectingeducation.com for the Google Apps assignment and resource page.)

GOOGLE APPS IMPROVES ASSESSMENT
Often students are surprised when they get an assignment back from their teachers who have given them further instructions. The student followed these instructions and submitted the work only to discover their assignment was assessed as being below standard.

Google Apps allows students to avoid the shock of receiving a low mark--after it is too late--because they can share their documents with the teacher as they are working on them. The teacher can make constructive comments right on the assignment document. This gives the student the opportunity to improve their work before they submit their final version.

Also, when students create documents, not only are they automatically saved every few minutes, but...
every single revision is recorded. The teacher is able to see every revision and the number of revisions, and so is an excellent way to eliminate plagiarism.

In our grade 12 English course, students are required to do all work on their major essay, including rough notes, on a Google Apps document. This document is then shared with the teacher. Typically a 3000 word essay would have anywhere from 70 to 300 revisions. If there were only one or two revisions then we assume the student copied the text from another source and pasted into it into the Google Apps document.

When students are working on a shared group assignment document, Google Apps automatically records who did what work. Students working in groups could use this to put pressure on group members who are not working. Also when the document is shared with the teacher, the teacher can see who is not pulling their weight. Since the document is shared in real time, the teacher can contact students to ask them to contribute before the assignment is due, and before it is too late.

Another advantage for collaborative documents is that they can be viewed by a teacher who may have a concern about a student. Imagine the following scenario wherein a student starts Grade 9 and is given a Google Apps login, which he keeps all the way through Grade 12. Most of the assignments the student does are on Google Apps. Many of these assignments are shared with teachers who make comments and give a score that is recorded on the assignment. A student entering Grade 10 and having trouble in his English class can immediately gain assistance from the teacher. The English teacher can go back and look at the student's Grade 9 English assignments to see the comments and the grade given by that teacher.

GOOGLE APPS AND VIDEO
Students are part of the Youtube generation and many are comfortable making videos. At my school, teachers often give their students the opportunity to create videos as part of their assignments or projects. Google Apps has a module that allows teachers and students to upload videos in the same way as Youtube. The main difference is that these videos are not available to the public. They are only available to users in the domain. Additionally, whoever uploads the video can specify exactly what users have access to view it. These videos then become stored as part of the domain and students and teachers can rate or add their comments to them (there is an option to turn this feature off). Students can also upload projects and footage of class trips while teachers also create tutorial and informational videos. Once the videos are uploaded they can be embedded into a web page.

IMPLEMENTING THE PROJECT
Google gives schools two options to register and setup Google Apps. They can either register and set up Google Apps themselves or they can go through a Google Apps partner who will charge for the service. These partners are listed on the Google Apps web site.

At Adam Scott CVI, I registered and set up Google Apps myself. The process was straightforward because Google provides very clear information and even how-to videos. To register for Google Apps, Google requires proof your school is a non-profit educational institution and approval from a school administrator. The school needs a registered web address, which will become part of the Google Apps domain. So after completing the registration for all applications--calendars, emails etc; you will use that web address.

Getting Started
When I set up Google Apps in January 2008 for my school, it took about two weeks from the beginning of the registration until I had all students on the system with logins. Currently, because of the increase in demand, the registration process can take up to six weeks.

The creation of user logins was Simple. Google only requires a text file with the first name, last name, login, and password of each student and teacher. This is important because Google does not require phone numbers, addresses, or any other identifying data and so if an outsider was ever to hack into the domain they would not have access to private data. Most schools already have text files with student data.
that can be used to create batch files so the logins can be created automatically. The whole procedure took less than 30 minutes for around 1000 users.

Initially two classes were selected to test Google Apps--both from Grade 12 English. These classes were selected because I felt senior level students would learn Google Apps more quickly. Later when I implemented Google Apps in lower grades I found that virtually all students from Grades 9 to 12 had little problem learning how to use Google Apps.

The first teacher to use Google Apps with his class was an English teacher with "average" technical skills. The teacher had little problem learning Google Apps, even though, not surprisingly, he did not learn it as fast as most students. (See [www.connectingeducation.com](http://www.connectingeducation.com) for videos of teachers talking about Google Apps, including Cory Pavicich, Watershed School's (Ontario) Director of Educational Technologies, who says: "Our veteran staff, almost without exception, asserts that this is the best classroom software they've ever encountered."

**The Follow Through**

Before students were given their Google App logins they were required to have a permission form signed by a parent or guardian. See the site [www.connectingeducation.com](http://www.connectingeducation.com) for the permission form; any teacher can edit this form and use it for their school.

Each class was given about 20 minutes of instruction on using Google Apps. Students were also instructed not to use Google Apps for any personal email or chats. In other words Google Apps was for schoolwork and if they wanted to socialize, they had to use their personal email and social networking sites. Since starting the project over a year and a half ago, I have not encountered any problems with students using Google Apps inappropriately.

I surveyed students on how they liked Google Apps and whether it was helping them in their classes. Most students felt it was a great tool because they could use it at home and school and they never lost documents. I also noticed students who were only required to use Google Apps in their English class started using Google Apps in other classes including Math and Geography—even though those classes were not using the service officially. I even started to get students who were not part of the Grade 12 English classes asking for logins.

After the success with the grade 12 English classes, I introduced Google Apps to other classes from grade 9 to grade 12. Math teachers really liked Google Apps because their students were able to work on spreadsheets at home (many students did not have the software at home). In creating a web site, the Geography teachers used the Sites feature to add videos and Google Gadgets right onto the class site. Other teachers also got on board with Google Apps because their students requested it. The students were using it in their other classes, saw the benefits, and wanted all their teachers to use it.

**CHALLENGES IMPLEMENTING GOOGLE APPS**

There is resistance to the use of Google Apps in some educational communities because student and teacher data including all email is located on a server outside the domain of the school district. The main concern is that privacy and security may be compromised.

As of the writing of this article, I have not found any breaches concerning the security or privacy of any student or teacher, and this includes millions of users. I also contacted Google who said they know of no such case. A much larger concern is how students use their personal email and social networks where students are completely exposed to the public.

Google has responded to these concerns with a free offering of their Postini Services, a product specifically designed for Internet security, with the Google Apps Education Edition. Postini can be used to ensure email is only sent to addresses within the domain and only approved email addresses outside the domain can be accessed. It also has filters to catch students who use inappropriate language or who may engage in cyberbullying. And, it keeps emails that have been deleted for auditing. Also the virus and spam checker is updated on a daily basis.
CONCLUSION
Google Apps has significantly improved the way students and teachers work at Adam Scott CVI, providing a common collaborative system that virtually supplies all the applications and communication tools needed, under one platform, and at no extra cost. It makes using technology easier as the computer environment is the same at school and at home. Additionally, because Google Apps eliminates or limits the need for printing and photocopying, it is both cost effective and easier on the environment.

REFERENCES


Note: To view Google Apps at work and for all links, podcasts, and videos mentioned in this article, visit connectingeducation.com, a non profit educational web site.

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