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Cloud-based Blended Synchronous / Asynchronous Shared Documents

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János Varga explains how cloud-based blended synchronous/asynchronous shared documents promote collaboration and active learning among students.

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The Issue

Today, many educators agree that active learning leads to deep learning. To achieve deep learning, students need to read, write, discuss, debate and engage each other in meaningful ways. They need to work together collaboratively and apply what they have learned. This type of collaboration is well supported in the classroom, where students can interact in teams or groups. Often classroom design, equipment layout and seating arrangements provide the right atmosphere for work to be socio-constructed, but school projects extend beyond the time allotted for classroom learning.

How can students be supported and encouraged to continue to engage with each other outside the school premises when work needs to be completed after teaching hours? Both asynchronous email and synchronous Instant Message (IM) chat offer only partial solutions to this problem. Recently however, a new group of blended synchronous/asynchronous tools have become available, providing a more complete solution. Research shows that these tools not only support but also can enhance out-of-class collaboration to promote active learning.

The focus of this report is to discuss the experience gained using a Cloud-based Web 2.0 blended synchronous/asynchronous Internet tool that provides shared documents to facilitate a new form of student collaboration. Several researchers believe that using such tools may enhance student engagement by enabling both in- and out-of-class collaboration, thereby facilitating active learning with positive outcomes. This article reports on the tool called typewith.me. Studies show that students find that this application provides a shared document and proves to be an effective and efficient way of communicating while they engage in group projects.

In this report, we will first define some relevant terms. Next we will introduce the reader to different aspects of shared documents. After that, we will look at practical applications, common concerns, screenshots and students remarks about this issue. Finally, we will provide useful references and a link to a YouTube video

demonstration of typewith.me.

Defining Terms

Cloud computing is defined in Wikipedia (2011) as the provision of computational resources on demand via a network. Resources are presented to the user in a simple view, called an abstraction. A provider's offering of abstracted Internet services is often referred to as "The Cloud". The tools discussed in this article use browser interfaces to facilitate such interaction.

The term Web 2.0 is commonly associated with Web applications that provide interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web. According to Wikipedia (2011), a Web 2.0 site gives its users the free choice of interacting or collaborating with each other in a social media dialogue as creators and consumers of user-generated content in a virtual community. Web 2.0 technologies can be considered an extension of the previous generation of Web technology tools that presented information to the user, but did not allow for much interaction (Hazari, North & Moreland, 2009).

Emerging technologies provide opportunities for instructor–student as well as student–student real-time (synchronous) and/or time-delayed (asynchronous) collaboration. Beldarrain (2006) points to first-generation Web tools, such as email, chat rooms and discussion boards, as examples of these technologies. He predicts, however, that it is the second-generation of tools, such as the tool under discussion here, that promises to take interactivity to the next level to create engaging learning environments. Many second-generation telelearning/teaching tools have recently been developed that now effectively combine mobile learning, social interaction and collaboration. Even though collaboration technology may be instructionally imperfect, according to Taran (2004) it may be engineered in such a way as to support active student participation, engage deeper levels of learning and positively transform educational practices.

Information Technology (IT) as part of a teaching strategy is proving to be an important feature in today’s classroom (in this report the terms Internet, IT and ICT are used interchangeably). As technology develops in leaps and bounds, new techniques, new software and new tools become available. The Internet brings a plethora of hitherto unthinkably powerful tools to educators’ disposal and the development of such tools creates a push/pull effect on students who are becoming technologically savvy. Many of the new collaborative tools can be used to create innovative and exciting methods of teaching. They have the power to motivate and instruct students in ways that were not possible only a few years ago.

It is not only Generation Y students (often called the Net Generation) - those born between 1982 and 1991 - who feel at home with the Internet; young people born after those dates are even more comfortable and expect to use technology in the classroom. These students, who for the first time in history are more technologically advanced than their parents, will embrace the Internet in the classroom since their use of technology is already sophisticated and pervasive. Research conducted by the Insights division of Ypulse in September 2010 shows that 94 per cent of Gen Y students are on Facebook. It is therefore highly likely that all Generation Y students in our classrooms are already online and connected. It is also becoming evident that

as technology grows to support out-of-class work, students will make use of the facilities offered by remote tools. They often prefer to continue their collaborative group-work after class from locations such as cafeterias, coffee-shops or from home, since all they require is a browser interface.

Pedagogical Benefits and Practical Advantages of Using Synchronous/Asynchronous Shared Documents

Pedagogical Benefits

The conceptual framework of socio-constructivism, developed mainly by Vygotsky (1962) and Piaget (1967), has shown the importance of social interaction for learning and has been linked to active learning by Petress (20089), who states that students who share findings, exchange views and debate topics among themselves are typically active learners. Such exchanges add measurably to what is learned. These learners take a dynamic and energetic role in their own education, and through their participation learning becomes self-reinforcing. Students are not overly dependent on teachers and tend to regard them more as resource people. Active learning increases confidence, stimulates pride and imparts credibility in the eyes of the teacher, classmates and parents. It tends to make learning more fun and personally satisfying and stimulates a thirst for broader and deeper understanding.

Small-group learning - a method of active learning supported by socio-constructivist learning theory - is beneficial because of its ability to promote problem-solving skills, interpersonal communication and critical thinking (Clark et al., 200810). This is reinforced by Petress (2008), who says that for learners, not only is this method more energizing, but it also has been associated with greater assimilation of subject matter (p. 1). It has a positive effect on student achievement in almost any discipline and when students are encouraged to produce new knowledge and to share that knowledge publicly, they will be compelled to produce their best work (Katz & Rezaei, 199911).

Studies on group learning with computers have reported a greater quantity and quality of daily achievement, more successful problem-solving, higher performance on factual recognition and higher application learning when compared with competitive learning or individualized learning with computers, according to Katz & Rezaei (1999). Educational technology can enhance good instructional design.

Practical Advantages of Using Shared Documents

- Ease of use and lack of confusion. A unique URL showing details of the assignment and naming team members can be created at the outset, for all the teams. The whole class can view this information on a shared Course Management Website. Teams are given direction and have their focus on a collaborative document from the word go. These documents may be pre-edited to include details of the assignment.
- Portability/accessibility. Any location with Internet access may be used in and out of class. Teams often arrange their online rendezvous before leaving the classroom.

- The instructor can not only monitor the team interaction, but can contribute by offering advice and motivating the team or messaging select individuals. By signing in to a shared document, he/she can join that team, becoming part of the process rather than just an observer. A unique advantage is being created here—to witness or be part of the development of an assignment, rather than being the recipient of it after completion. Questions may be answered, points clarified, guidance given as the assignment is being worked on—before it is handed in.
- A permanent indelible record of group and individual effort/interaction is available.
- Publishing creates accountability and perhaps a sense of healthy competition, since it is not only the instructor who is the recipient of the product. Peers, other teams or even the whole class could have access to the work being produced, according to the level of sharing decided on for the URLs of the documents.

Practical Applications

Practical Applications and Common Concerns

Comparing the Functionality of a Few of the Available Asynchronous/Synchronous Shared Document Tools

A series of text tools became available over the past year. These have spawned from the release of open source code for an asynchronous/synchronous shared document application made available by etherpad.org. The tools have added to the functionality offered by the older and better-known Google Docs by allowing instant messaging and a timeline function. Some of these programs and their functionalities are listed in Table 1 below. The terms in the column headings are fully explained in the succeeding paragraphs. A more extensive list of programs is available by following the link in the Useful References section of the article12.

	IM	Timeline	Colour-coding	Sign-in	Free/fee
typewith.me	✓	✓	✓	No	Free
sync.in	✓	✓	✓	No	Both
ietherpad.com	✓	✓	✓	Both	Free
piratepad.net	✓	✓	✓	Both	Free
Google Docs	No	No	✓	Only	Free

Table 1 – Some of the tools now available on the Internet

Asynchronous/Synchronous Shared Documents

The shared documents referred to in this table have both asynchronous and synchronous capability. Shared

documents are asynchronous in the sense that they may be updated at any time, regardless of where or when other users are online. Additional synchronous capability means that data can be entered in the document in real time even when other users are online, simultaneously with the pressing of the key of any letter on the keyboard. Although one might expect the simultaneous entering of data to be confusing for the users, in practice entries do not interfere with each other. On the contrary, the facility of writing simultaneously tends to create a dynamic, interactive and collaborative feeling among team members. As each person's key entry is colour-coded, it is clear who enters what text, and teams appear to enjoy the process of dynamic co-creation. One word of caution however: teams need to be relatively small—3 students are ideal but 4 or 5 are workable. Beyond this number it might become confusing for team members to manage and follow each other's chats and entries.

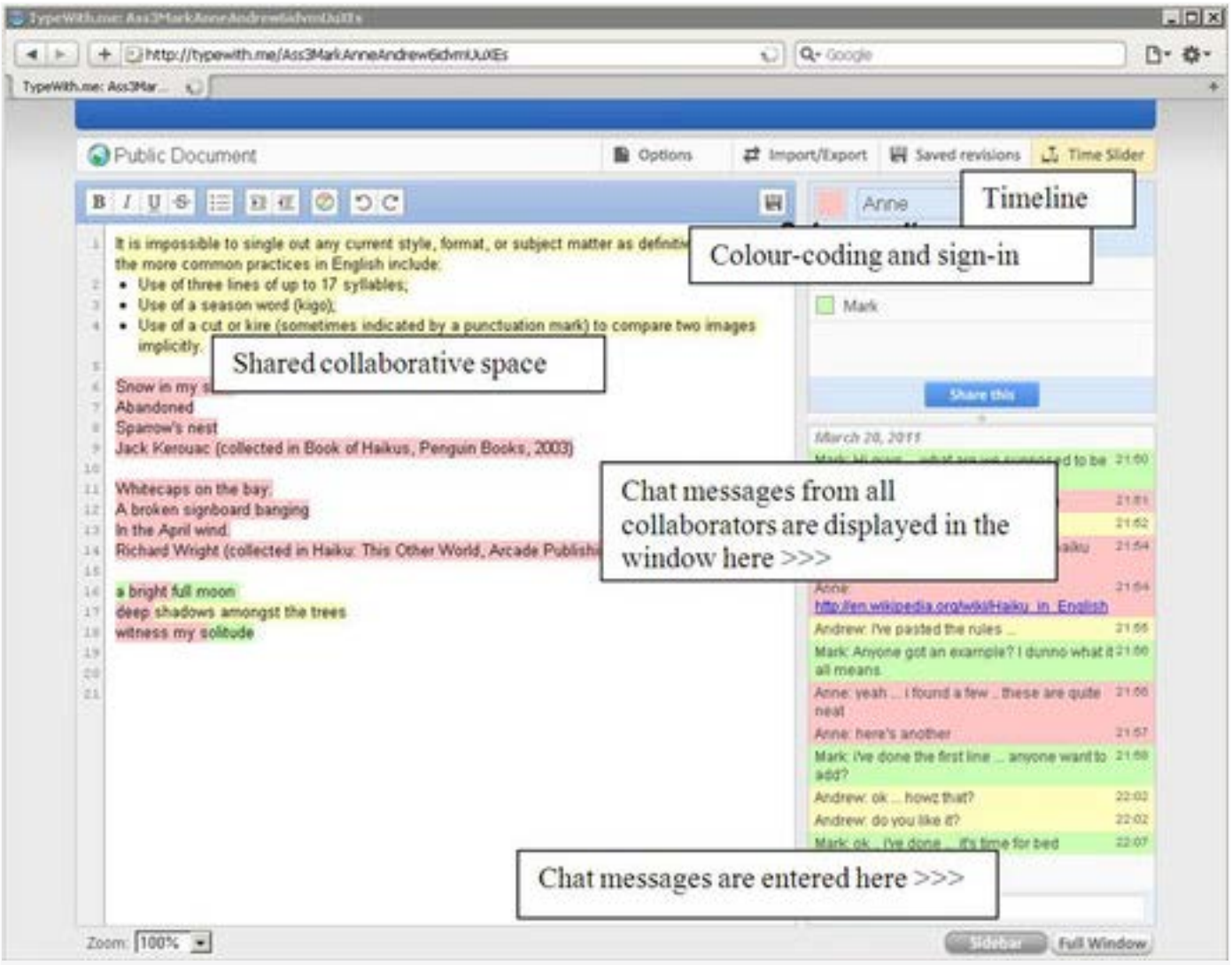

Figure 1 — The layout of the *typewith.me* window

Chat instant messaging (IM)

The window on the right-hand side of the screen facilitates chatting between users. These chat messages are not letter-by-letter synchronous (as the shared document is made to be) and will appear in the window of other users only once *Enter* has been pressed on the sender's keyboard.

Timeline

This facility archives the document and provides for infinite undo of entered text and history playback. When the timeline is activated, the application re-creates the original text entry, character by character, edit by edit and insertion by insertion, bringing the document to its most current state. It is not possible to truly erase any entry since the timeline will show both the entry and the subsequent erasure as they happened in real time.

Color-coding

Each user is named and allocated a specific colour. A list of currently active users and their identifiable colours is always displayed above the chat window. Each IM message and every entry on the shared document by this user are distinguished by the assigned colour. In this way, the contributions made by each person sharing this document are clearly visible.

Sign-in

Some applications do not require a sign-in. Other applications provide a User ID and Password sign-in facility for security purposes and to limit the number of collaborators on a document only to designated individuals. Other applications offer a free public site option and a fee professional option; the latter requires a sign-in that gives the user access to further useful features.

Common Concerns

Document security. Table 1 shows some of the tools now available on the Internet. Some require User ID and password sign-ins. It may be thought that without a login/password facility the documents are not secure and may be easily tampered with.

It is certainly valid that if the document being constructed is of a sensitive nature, the application offering password protection should be used. However, even a document which is not password-protected possesses a high degree of security through its long URL. Each URL is composed of lower-case and upper-case alphabetic letters and numeric symbols. A 10-position URL using both lower-case and upper-case alphabetic characters provides 10-to-the-power-52 possible combinations and therefore has a low likelihood of either accidental or deliberate discovery.

It is also possible for Google search engines to index a Shared Document page and thereby make it easily available to an audience searching with specific keywords. This possibility could be a concern if a document contained sensitive information, but the combination of non-sensitive information and the short life of a document (merely a few weeks) will reduce the possible impact of indexing. (See Deletion of Documents, below.)

Impermanence of free applications. One caveat of using these free Internet applications is that they may at any time become inoperable; a program may cease to be supported. However, the likelihood of losing data is minimized, provided this possibility is acknowledged and if periodic export of the document is done. In the past, an application that was withdrawn from service was inevitably replaced by another application of equal or better performance.

Deletion of documents. Unless the document is in use, it only remains available for a limited time. The system, without warning, will reuse a URL within a week or two from the time the document was last accessed. It is therefore imperative that a document be exported to MS Word for long-term archive if the information needs to be retained for a longer period.

Colour confusion. Team members at any time have the opportunity to deliberately change their colour-coding. This is not desirable, and it is better to keep the same colour throughout the collaborative process. However, a person logging in may be assigned a colour different from the one he/she was previously assigned if the login is done from a different computer than had been used previously. It is worthwhile to advise students that if this happens, they should change their colour back to their original assignment, to enable their team to keep track of member entries.

Sample Collaborative Work Session

A team of 3 people collaborate to write a Haiku, a form of Japanese poetry. The chat window on the right shows the discussion and the document on the left shows individual contributions to the haiku.

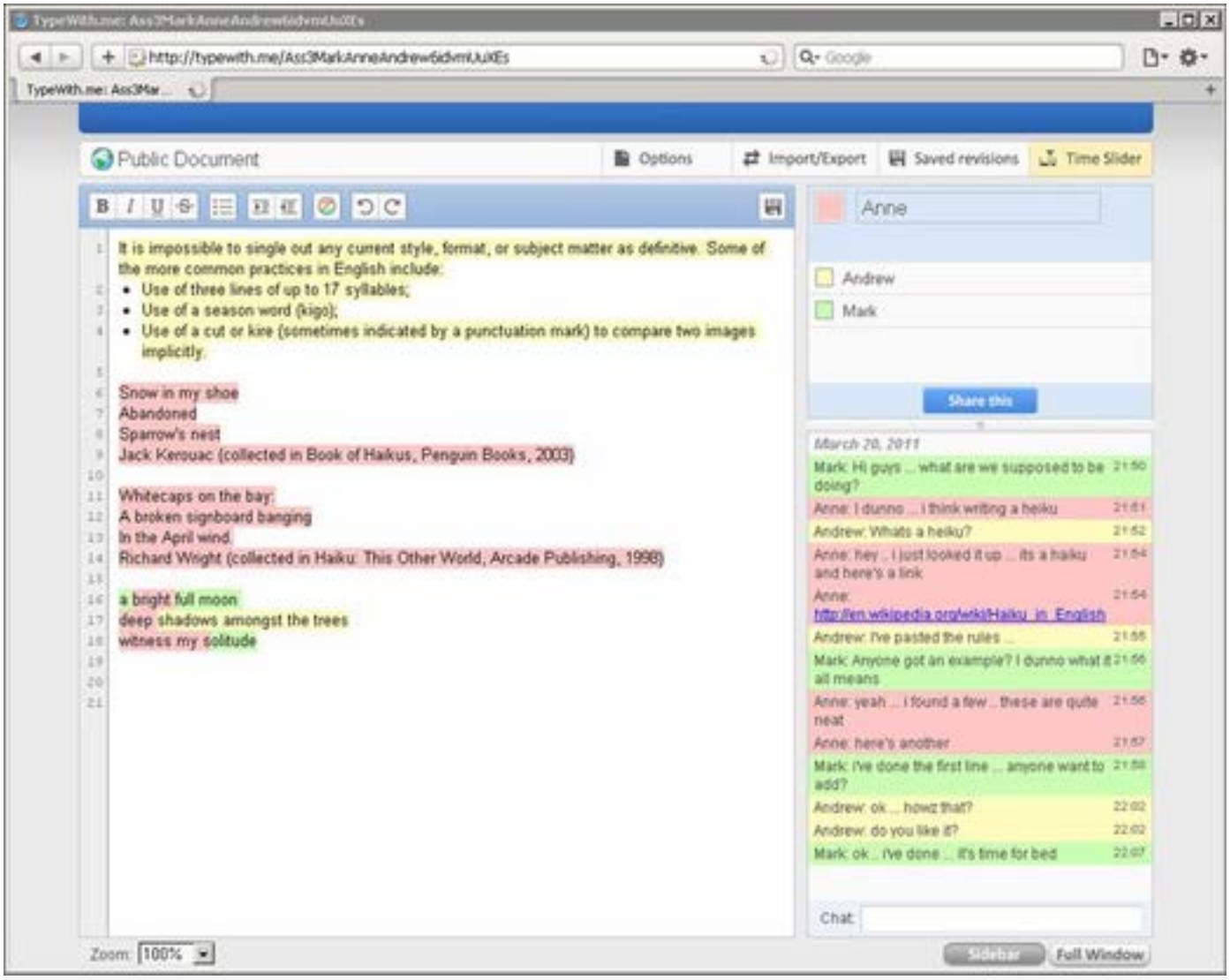

Figure 2 – Screen capture showing the generated messages during the writing of a haiku

Notice the information contained in the URL. It is quite handy for the URL to also include details such as the assignment title and the names of team members. Once the link to a *typewith.me* document has been received, whatever information someone wishes to add can simply be typed in. This new URL is then copied and pasted into a browser address window and circulated to the team members. For example "http:/typewith.me/6idvmUuXEs" can be changed to: "http:/typewith.me/Ass3MarkAnneAndrew6idvmUuXEs". Not only does this improve the security aspect, but now it is clear to the users exactly which team is working on this document.

Using the Timeline

The Time Slider provides for unlimited undo of entered text and redo of history playback. With activation of the Time Slider, the application re-creates the original text entry, character by character, edit by edit and insertion by insertion, bringing the document to its present state. This figure illustrates how by activating the Time Slider button for this exercise of writing the haiku, 122 versions of the document were saved during the writing process.

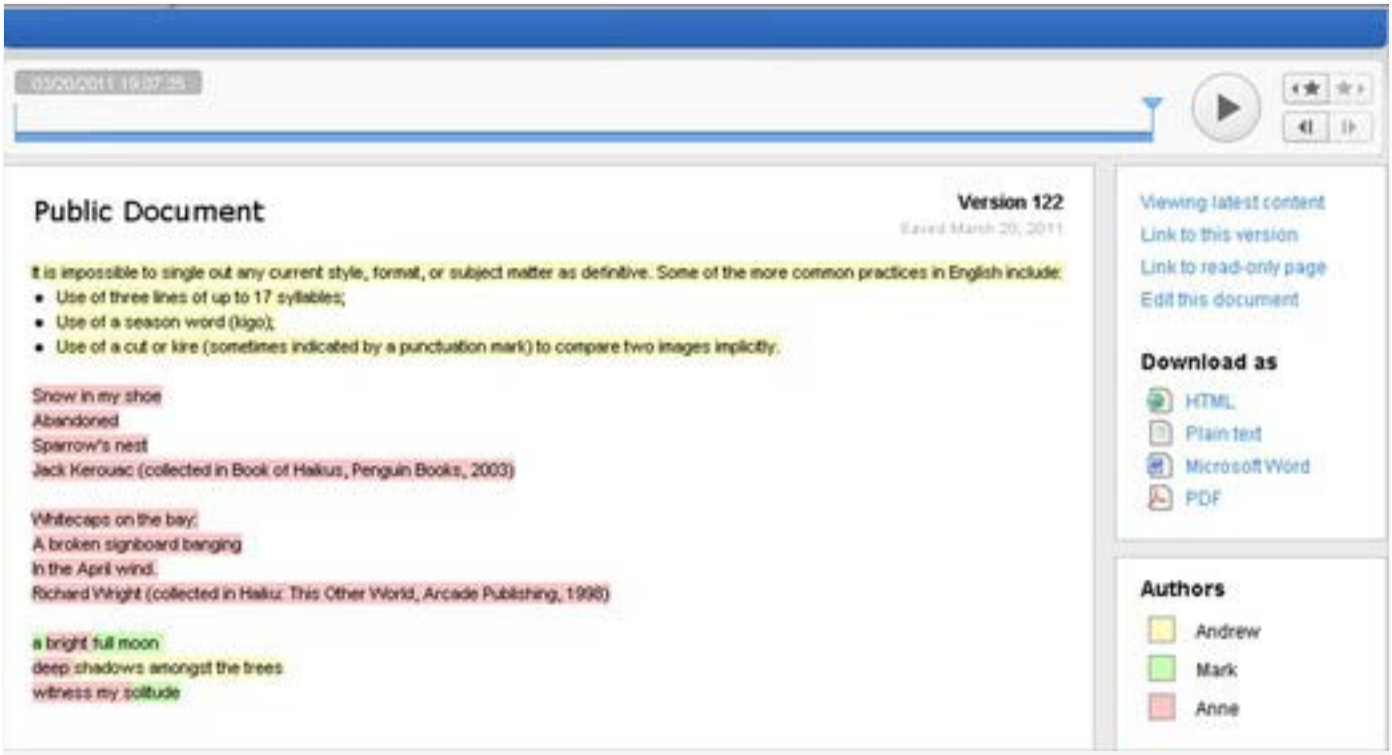

Figure 3 – Screen capture showing the screen after Time Slider reconstruction is requested

A permanent indelible record of individual effort and team collaboration is available. Data cannot really ever be deleted because of the frequent number of versions being constantly saved as the document is being used.

What Do Students Say?

Students in one of my recent Communication classes used *typewith.me* and shared documents to power their team communication during assignments. Here are some of their comments:

- It was very useful, and I think it is a great tool to do homework. It was also very interesting to be able to share information between groups.
- It was a useful, easy and fast way to share information and to work out the assignments.
- I think it's a terrific tool for getting everyone together to collaborate on a project. It's like sitting side by side... only virtually.
- I think it works very well. It is good tool, which facilitate you to work as a team.

Useful References

- Wikipedia entry on Cloud computing where the principle behind "the Cloud" is that any computer connected to the Internet is connected to the same pool of computing power, applications, and files. Users can store and access personal files such as music, pictures, videos, and bookmarks or play games

or use productivity applications on a remote server rather than have to physically carry around a storage medium: http://en.wikipedia.org/wiki/Cloud_computing

- Wikipedia entry on Web 2.0. The term Web 2.0 is associated with Web applications that facilitate participatory information sharing, interoperability, user-centered design, and collaboration on the World Wide Web. A Web 2.0 site allows users to interact and collaborate with each other in a social media dialogue: http://en.wikipedia.org/wiki/Web_2.0

- Hazari, S., North, A., Moreland, D. (2009). Investigating pedagogical implications of Wiki technology. *Journal of Information Systems Education*, 20(2), 187-198.

- Taran, C. (Greenwich: 2004). Using Inexpensive Collaboration Software for Delivering Effective Online Synchronous Training. Distance Learning. 1(6), 21-26.

- In a previous Profweb article, "A Guide for Integrating ICT into a Program", Roger De Ladurantaye clarifies the possible confusion with the use of these terms. He explains that IT stands for Information Technology and that ICT is short for Information and Communication Technology. These are synonymous and in French the most commonly used term is TIC, which stands for *Technologie d'information et communication*: www.profweb.ca/en/publications/featured-reports/a-guide-for-integrating-ict-into-a-program

- Generation Y—also known as Gen Y, the Millennial Generation (or Millennials), Generation Next, Net Generation and Echo Boomers—describes the demographic cohort following Generation X, and are accorded various dates of birth. According to Wikipedia, commentators have used varied dates ranging from the 1970s to the early 2000s for this group; see http://en.wikipedia.org/wiki/Generation_Y. Ypulse places the birth dates for Gen Y students between 1982 and 2004; see the article referred to in footnote iv above. According to social historians Howe and Strauss, the Millennial Generation are those born between 1982 and 2002: http://eubie.com/millennials.pdf.

- Social Network Disconnect Friday, October 8, 2010, 10:24 AM. Dan Coates, president of Ypulse, a leading authority on tween, teen, college and young adult insights for marketing, reports in Mediapost. The report is on research conducted by their Insights division in September 2010 on the Gen Y generation's use of technology, referring to those born between 1982 and 2004 : http://www.mediapost.com/publications/?fa=Articles.showArticle&art_aid=137299&lfe=1

- Petress, K. (Chula Vista: Summer 2008). What is meant by "Active Learning?" Education. 128(4), 566-570.

- Clark, M.C., Nguyen, H.T., Bray, C., Levine, R.E. (Thorofare: Mar 2008). Team-Based Learning in an Undergraduate Nursing Course. Journal of Nursing Education. 47(3), 111-118.

- Katz, L., Rezaei, A. (Toronto: Summer 1999). The potential of modern telelearning tools for collaborative learning. Canadian Journal of Communication, 24(3), 427.

- This is an Etherpad link to a list of shared document sites which are available to the general public. The sites listed do not have any affiliation with the Etherpad Foundation. Etherpad warns that all such public sites may be indexed by Google. The problem concerning security is discussed above in the section under Common concerns: Document security:
  http://etherpad.org (Click on the Public Sites tab)