English Language teaching and learning in the Age of Technology

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This talk is divided in three parts. In the first one, I will talk briefly about the age of technology. In the second, I will present three interrelated theoretical views that might underpin experiences in the use of technology for English language teaching. In the last part, I will present suggestions of digital tools which can help us implement the proposals discussed in the second part.

1. The age of technology

The Internet became really big. According to Facebook statistics[1] they "had 845 million monthly active users at the end of December 2011" and Twitter[2] announced this March that they have more than 140 million active users. In 2011, there were 79.9 million Brazilians with internet access (home, work, school and cybercafes among others), according to *Ibope Nielsen Online*[3].

My grandson is fourteen and I guess he cannot imagine how life was without digital technology. Fourteen years ago, when he was born, I talked about the Internet and language teaching in a conference in São João Del Rei. I asked the audience who had an Internet account and I could hardly spot the hands of the ones who did. At that moment, I realized I was talking about something totally meaningless for that audience.

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[1] Available at <http://newsroom.fb.com/content/default.aspx?NewsAreaId=22>. Access on April 22, 2012.
[2] Available at <http://blog.twitter.com/2012/03/twitter-turns-six.html>. Access on April 22, 2012.
[3] Available at <http://www.ibope.com.br/calandraWeb/servlet/CalandraRedirect?temp=5&proj=PortalIBOPE&pub=T&db=caldb&comp=Internet&docid=9725B59E0CD6FC43832579DC005A03D9>. Access on April 22, 2012.

Now I would like to ask you: please, raise your hands if you **do not** have an email account?

I cannot forget another experience in another conference, also in the nineteen's, when a colleague of ours reacted angrily against my advice that computers should be integrated into our classrooms. She said that it was technology for rich people and not for public schools.

Today every school in our country has a computer lab and the project UCA (um computador por aluno/one computer per student) is being tested in some towns in Brazil. All the students in public schools in Tiradentes, near São João del Rei, have their own computer now. The town has a public wireless connection, free of charge, which enables the students to access the Internet at home.

Figura 1. Students in Tiradentes with their UCAs.[4]

The technological revolution and the rapid spread of digital tools over the last few years have highly affected language teaching. Traditional media – newspaper,

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[4] Available at
http://www.metasys.com.br/index.php?option=com_content&view=article&id=403%3Alicenca-para-sair-da-sala&catid=1%3Anoticias-pt&Itemid=50&lang=pt

books, radio – are giving way to content which is consumed in cell phones, laptops and tablets. Traditional ways of reading are also being replaced by the integration of readers.

An example of the integration of readers is the new *Kindle* device (Amazon's digital reader) which tells you how many readers have highlighted specific parts of the text. Rheingold (2012, K. 5395[5]) says that "humans are human because we use communication to organize collective action. Social media can amplify collective action". That's what happens when I read books in Kindle. Whenever I see that other readers have highlighted a passage, I must confess that there is a shift in my focus of attention and sometimes I read that part twice or more. The example on the screen is a quotation from Richard Dawkins in the book *The information, by James Gleik* (2011, K.130) which was highlighted by 138 readers till April 24.
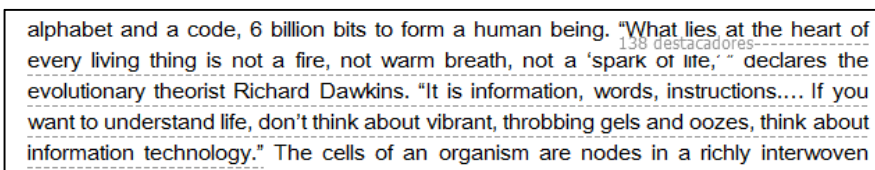

Figure 1. Image from the book *The information by James Gleick*

By the way, I do not use *Kindle* reader anymore, but the free *Kindle* apps for iPad and for windows. My *kindle* machine lies in a drawer. As those machines are integrated, you can chose where to read. You can also start reading in one and finish in another.

A good example of media integration is the application (app) for iPADs, called *The fantastic flying books of Mr. Morris Lessmore* by William Joyce. The app was inspired in the printed book and if you want to have a look at it, there are six images available at the online bookstore *Amazon* (<http://www.amazon.com>).

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[5] As Kindle does not show pages, but positions, I am quoting the positions as K. plus the position number)

Figure 2 Images of *The fantastic flying books of Mr. Morris Lessmore*[6]

Inspired in the book, the film, developed by *Monbot* studios, was awarded the Oscar for Best Animated Short Film in 2012. Their page[7] on the web tells us that the story was "inspired in equal measures, by Hurricane Katrina, Buster Keaton, The Wizard of Oz, and a love for books" and that it "is a story of people who devote their lives to books and books who return the favor".

We also learn that "In this reinvention of digital storytelling you can repair books, tumble through a storm, learn the piano and even get "lost in a book," flying through a magical world of words, giving you a dynamic journey through the story".

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[6] Images available at http://www.amazon.com/exec/obidos/ASIN/1442457023/simonsayscom

[7] Available at <http://morrislessmore.com/?p=film>. Access on March 5 2012;

Is it a book? Is it an animated film? Is it a game? Is it a toy? You choose what it is. Everyday my eight-year granddaughter plays with my iPAD, she learns a new way to "read" it. She listens to the story and repeats some sentences, she takes funny photographs, she plays with a puzzle, and she writes. Watch a short video to have an idea of how it works at <http://morrislessmore.com/?p=film>.

Well, you might have been asking yourselves. Why is she talking about children? We are university teachers. I would answer with two other questions? Are we educating teachers for this digital generation of students? Are we taking into account new literacies, which are essentially social?

The interconnectedness of digital technologies has created new contexts for language learning and new labels have emerged for teaching and learning in the digital context: Computer Assisted Learning; Web-based Learning; Online Learning; Distance Learning; E-Learning; Tandem Learning; MOOCs (Massive Open Online Courses); M-learning (Mobile Learning), etc. Are we educating teachers for all those digital learning environments?

In the next section I will talk about three theories which can help us think of the new learning contexts created by the age of digital technology

2. Theory

There are several relevant theories as the ones we find in the book *Theoretical foundations of learning environments*, edited by Jonassen and Land (2000) such as the activity theory, communities of practice, and distributed cognition. Today, I will talk about three interrelated theories: connectivism (SIEMENS, 2006, 2006), new literacies (RHEINGOLD, 2012) and Schneiderman's framework for technology-based teaching and learning (SCHNEIDERMAN, 2003).

2.1. Connectivism

I do agree with Siemens (2005) that "a central tenet of most learning theories is that learning occurs inside a person" and that "these theories do not address learning that occurs outside of people (i.e. learning that is stored and manipulated by technology)". As Siemens (2006, p.120) puts it, "learning is evolutionary. It is not an event or end goal. Learning is a process. Our personal network is continually being augmented and enhanced by new nodes and connections".

Siemens (2005, 2006) proposes an alternative theory integrating "principles explored by chaos, network, and complexity and self-organization theories. He calls it Connectivism – "the assertion that learning is primarily a network-forming process" (Siemens 2006, p. 15).

His assumption is that learning does not occur entirely under our control. It "can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and these connections that enable us to learn more are more important than our current state of knowing" (Siemens, 2005).

He adds that

> The starting point of connectivism is the individual. Personal knowledge is comprised of a network, which feeds into organization and institutions, which in turn feed back into the network, and then continue to provide learning to individual. This cycle of knowledge development (personal to network to organization) allows learners to remain current in their field through the connections they have formed,

The principles of connectivism are:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.

- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer, it may be wrong tomorrow due to alterations in the information climate affecting decision.

Siemens (2005) summarizes the main traits of connectivism in four words: diversity, autonomy, interactivity and openness. As an example of an-online course where we can find these traits is the Ingrede Project at Universidade Federal de Minas Gerais coordinated by my colleague Junia Braga and I. Our classes have around 1500 students from different knowledge areas learning how to read in English. The diversity of points of view is stimulated when they autonomously build a digital library and a collective glossary choosing texts and concepts they consider important in their knowledge field. They form a network interacting among them, reading and posting comments to the texts chosen by their online classmates. So the content of the course is not closed but open to new material brought by the students themselves. Some of these texts are eventually appropriated by the teachers who use them for learning activities and tests.

Summing up, the theory proposed by Siemens conceives "knowledge as a river, not a reservoir" He says that in "our internet-era knowledge is no longer suitable as a product – we can continue to revise, connect, and alter indefinitely" (SIEMENS, (2006, p.53). Siemens theory connects well with Rheingold's proposal of five literacies.

I must confess, I am not comfortable with the use of literacy to name any competence or skill as it has been done by many authors, but that is how Rheingold has done and I will be faithful to him.

2.2. New literacies

According to Rheingold (2012, K.163), literacy now means skill plus social competency in using that skill collaboratively. He adds that "five literacies are in the process of changing our world: attention, participation, collaboration, the critical consumption of information (aka[8] "crap detection"), and network smarts"[9]. Let's see what they mean.

Attention literacy refers to the mindful use of media. Rheingold (2012, K. 5320) says that "social media afford distraction, but attention can be trained". He adds that "social media attention requires understanding your goals and priorities (intentions), and involves asking yourself, at regular intervals, whether your current activity at any moment moves you closer to your goal or serves your higher priorities (attention)".

Where are you directing your attention to? I have seen people texting in the cinema or when driving and even a doctor checking her e-mail during a patient interview. I also think attention literacy can be thought in terms of not stealing other's attention. Someone texting next to you in the cinema, for instance, is also stealing your attention because of the light of the mobile and the same does the one who sends lots of spams to your e-mail account.

Participation, in my opinion, is a matter of citizenship and no wonder some countries have been trying to control the Internet. China, for example, has blocked Facebook. Rheingold (2012, K. 2465) believes that participation itself in the online world creates a distinct sense of belonging and empowerment in users. He points out that "participation, however, is a kind of power that only works if you share it with others" (K. 2482) and this leads us to the concept of curation, "a form of participation that can refine your captured information into contextualized knowledge, enhance your reputation, and serve the information needs of others at the same time" (K. 5382).

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[8] Aka means "also known as".
[9] Watch a video with Reingold at < http://www.youtube.com/watch?v=kxmG6VeNSuQ>

Rheingold (2012, K. 2780) says that "curation is short for each other's filter". A short video at < http://www.youtube.com/watch?v=eW775HIlVMg> will show you how it works.

Collaboration is a key concept in Rheingold's proposal. He says that "*Collaboration* is the most purposeful means of collective action. It uses networking, coordination, and cooperation as building blocks, adding to "exchanging information, modifying activities, etc.,"". (K. 3398-3414)

Rheingold (K.5390) highlights that "although the dominant narrative of biology, economics, and daily life has stressed competition and conflict, recent findings indicate a much larger role for cooperative arrangements". Shneiderman (2011) also emphasizes the importance of collaboration. For him "the new computing is about collaboration and empowerment" (K. 56).

I do agree that we find countless examples of collaboration on the Web and good ones are *Facebook* and *Twitter*, but, in my opinion, it is still a big issue in education. Although we would expect students to engage in collaborative practices, when using *wikis*, for example, some samples collected during my online courses for graduate and undergraduate students show that old practices in the form of patch work still prevail. In spite of the instructions, students seldom edit partners' work by correcting or adding more information and examples. Collaboration implies using fewer teacher centered course designs and mitigating students' resistance in engaging themselves in group activities.

A typical educational design based on collaboration is *tandem learning* and we have enough reports on such experiences in the work of João Telles and his collaborators at UNESP (see TELLES, 2009 and BENEDETTI.; CONSOLO; VIEIRA-ABRAHÃO, 2010). Some research on that was also done at UFMG by Braga (2004)

and Souza (1998). I believe that collaboration is usually present in most of the online activities some of you have been responsible for.

Rheingold (2012, K.3515) brings into the discussion about collaboration Lévy's concept of collective intelligence, "when all of us can be smarter than any of us".

> Lévy sees collective intelligence as an aggregation of skills, understanding and knowledge: skills, like literacies, unlock individual access, which must be actively used to acquire individual knowledge from the great collective pool amassed through literate culture; and understanding requires communication, discussion, debate, and direct experience (which Socrates claimed couldn't be conveyed through unloving texts). (Rheingold, 2012, K. 3530).

According to Rheingold (2012, K. 3548), he asked Lévy about "the skills needed to participate in and instigate collective intelligence activity today" and Lévy gave him the following explanation:

> The essence of this new skill is to create a synergy between personal knowledge management and find information sources, then filter, select, and categorize information for your own purposes. You have to decide which information to accumulate personally, to store or memorize. When you do this, you can share your personal knowledge with knowledge communities through social bookmarking or blogging or Twitter. When you tweet a URL, you usually include a brief commentary. The comments you share should help people categorize the knowledge you are signaling.

Finding information sources, filter, select and categorize are skills embodied in the **critical consumption of information** or crap detection. It can be defined as our ability to find relevant and accurate information on the Web and also to ignore non-relevant information.

Finally, we go to the fifth literacy, **network smarts**. Rheingold (K. 4521- 4535) states that "the internet and the cell phone have transformed communication from house to house to person-to-person". He adds (K. 4551) that "[t]he person has become the portal". Network smarts are the ones who are aware of their networks and the power of getting things done. What position do you occupy in your social network? Are you in a

central position so as to connect other people? As put by Shneiderman (K. 1062), you are evaluated today by "[…] how many messages you get a day, how many groups you contribute to, and how many other people link to your Web pages".

2.3. Schneiderman's framework

Schneiderman (2003, K. 1056-1062) states that "the old education emphasized acquiring facts and chunks of information that could be packaged into small teachable and testable units" and that "the new education emphasizes collaboration". The old education emphasized competition because only a few were supposed to get good marks and "students were prohibited from reading each other's work and required to work independently"

Schneiderman proposes a framework for technology innovation based on "growing circles of human relationships" (K.763). He "recognizes that "solitary work will always be necessary and group work has its problems" (K.783). He says that "working alone frees you from interdependence but means you have only your own skills and knowledge to rely on" (K.789).

His framework is composed of four stages: collect-relate-create-donate.
In the *collect* phase students gather information, including library research and web search. In the **relate** phase they work in collaborative teams and then **create**. Schneiderman (K. 1074) believes that "student learning accelerates when teachers require creative outcomes in individual and team projects". He adds that "software tools can make possible an unusually high level of creative accomplishment". Finally they **donate** their products. According to Schneiderman (K. 1074) "the *donate* activity stresses the benefits of having authentic, service-oriented projects that will be meaningful and useful to someone outside the classroom".

I must agree with him that when students have an outside audience for their productions motivation may be increased. Examples of donation in Brazil are **Themes for Teaching** and **ARADO**. **Themes for Teaching** is a repository of tasks for English Teaching, curated by Rosely Xavier here at UFSC and Arado at UFMG is a website where you can find books written by graduate and undergraduate students and a collection of links for English language teaching and learning.

In the third and last part of this talk, I will present suggestions of some digital tools I have organized following the four stages of Schneider's philosophy.

3. Web tools

It is my contention that, many other tools could have been selected, but, as Leu (2002) says

> As networked information resources become more extensive and complexly structured, and as ICTs continue to change with some frequency, no one person can be expected to know everything there is to know about the technologies of literacy; these technologies will simply change too quickly and be too extensive to permit any single person to be literate in them all.

My inspiration when organizing the collection of tools usind Schneiderman's philosophy comes from Penney's pyramid proposal[10], supported by Bloom's taxonomy. She used six learning objectives to categorize the tools: creating, evaluating, analyzing, applying, understanding and remembering.

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[10] Available at <http://www.usi.edu/distance/bdt.htm>, access on March 23 2012.

Figure 3. Samantha Penney's Bloom's Digital *Taxonomy* Pyramid

Penney's categories do not take into account the social dimension of learning and that is why I think Schneiderman's proposal is more adequate. In addition, I do not totally agree with some of her categorizations.

My collect-relate-create-donate digital taxonomy pyramid presents just a small sample of tools. The criteria for the selection of tools were to check if they were at least partially free and if they were adequate for English language teaching.
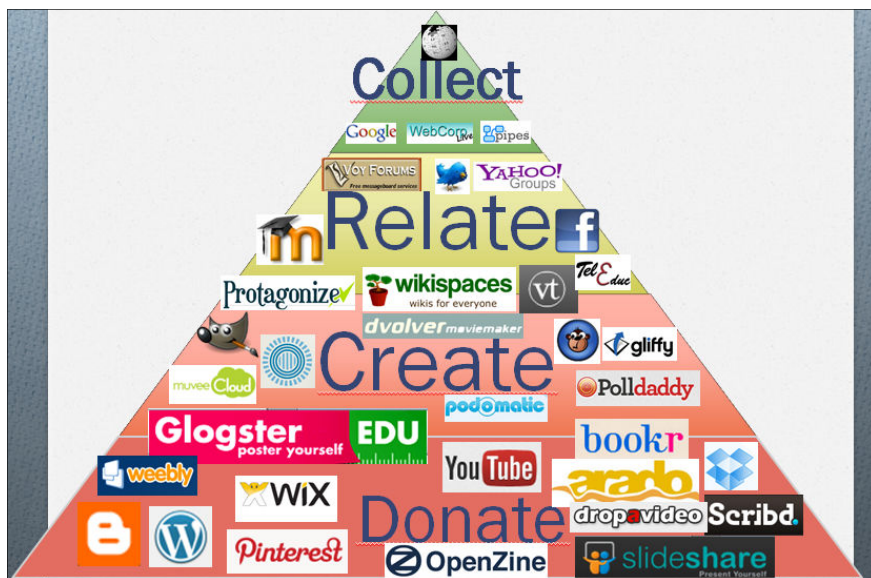

Figure 4. Collect-relate-create-donate digital taxonomy pyramid

Collect includes Wikipedia (a free collaborative encyclopedia), WebCorp ("a suite of tools which allows access to the World Wide Web as a corpus"), Google (a search engine) and Yahoo Pipes ("a powerful composition tool to aggregate, manipulate, and mashup content from around the web").

Relate gathers tools we use to establish social relationships such as the micro blogging Twitter; the discussion boards VoyForums (web only) and YahooGroups (web and email); the learning environments Moodle and Teleduc; and the social networking service Facebook. As you can see in the picture, the next tools are in between **relate** and **create** fields because they can be used to relate people and also to create things. They are Protagonize ("a creative writing community dedicated to writing various forms of collaborative, interactive fiction"); Wikispace (a space on the Web where you can share work and ideas, pictures and links, videos and media) and Voicethread ("a collaborative, multimedia slide show that holds images, documents, and videos and allows people to navigate slides and leave comments in 5 ways - using voice ("with a mic or telephone), text, audio file, or video (via a webcam).").

Create comprises Dvolver (to create animated videos); Glimp (an image manipulation program, Prezi (to create presentations), Gliffy (to create diagrams), MuveeCloud (to create collaborative album with photos, videos and music), Polldaddy (to create surveys, polls, and quizzes), Podomatic (to create podcasts), Glogster (to create multimedia virtual posters), Bookr (to create books with images and texts). Glogster and Bookr are also tools which can be used for material donation.

Donate: comprehends tools with which you can post content either created or collected by you. Weebly and Xwix for homepage building; Blogger and Wordpress for blogs; Pinterest for image curation; OpenZine to make magazines; Slideshare to share slides on the Web; YouTube to share videos; Scrib to share what you are reading and to

publish your own papers; Droavideo for video curation; Dropbox to save files in the cloud and share with your friends. The last examples are not tools, but examples of donation I have already talked about: Arado and Themes for Teaching.

All the examples in the Donate part are also good sources for collecting information and then feeding the "growing circles of human relationships" as proposed by Schneiderman (2003).

4. Conclusion

Schneiderman recognizes that technologies usually provoke controversy. He reminds his readers that "even books and paper faced resistance because they reduced human memory skills" (K. 1115) and he makes it clear that instructional technology will solve no education problem, but he believes, and so do I. that the integration of computing tools will bring positive changes.

In spite of the natural resistance to innovations, it seems that digital tools have been gradually incorporated into different kinds of learning contexts: from face-to-face to blended or online learning contexts. Students themselves are autonomously taking advantage of a range of free tools to develop their language skills.

We never know what new tools will appear and how they will affect us. An example is what is happening in Korea right now. Korea has been investing in English teaching and as they do not have enough proficient teachers, they have to hire foreigners to teach English and that costs them a lot of money.

They are now testing two types of robots to teach young students. One is programmed to teach English using voice recognition technology and the other is a telepresence robot with enables children to learn from native speakers of English who

are far away. Watch a video at <http://www.youtube.com/watch?v=M0T6uEEpiuQ> to see how Engkey robot works.

Strother (2010) quotes one of Engkey's creators, Kim, who said that the robots "can detect the motion of the English teacher. As soon as the teacher moves his or her hand, the robot raises its hand. If the teacher laughs, we can detect a laughing expression. So the robot can do just what the English teacher does".

The English-Teaching robot was included in the list of Time Magazine "50 Best Inventions of 2010" and was called by Mahr (2010) as the job terminator. According to Schuster (2010), English teachers will lose their jobs because "researchers have found that English teaching robots helped raise interest in the language and boosted the confidence of students". He says that by 2018, the 25,000 estimated English teachers will be out of work.

According to Strother (2010) Kim is not sure if the robots "could ever completely replace human teachers" and he thinks that students are the ones "who will determine whether robots can be successful substitute teachers". Strother gives voice to two ten-year-old students. One said he "he was a little nervous about the robot at first, but he liked its singing and dancing" and the other said she likes "the robot teacher better than human teachers".

I do not think we will compete with robots in Brazil, but I think we will surely be invited to produce more digital material. That seems to be the direction our government will pursue. At least, the Minister of Education, Aluzio Mercadante has recognized that "the school social arrangement is from 18th century. Teachers are from 20th century and the students are from 21st century".

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