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Dynamiques de développement au carrefour des mondes

PROCEEDINGS OF THE 4TH INTERNATIONAL COLLOQUIUM Challenges
and Uses of Information and Communication Technologies

Dynamics and development where worlds meet

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LEARNING IN THE INTERNET ERA: EXPLORING THE BENEFITS AND CHALLENGES OF A NEW COMMUNICATION PARADIGM

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Abstract

In the global web of information we call Internet, communication changed radically. Today we communicate at such a fast pace that the distances fade at an astonishing rate. In the Internet we communicate in a direct, real time fashion with the whole world. Never, in the history of mankind, ideas, information and products circulated so quickly and easily. In this article we will address the role of technologies, from teacher's auxiliary means to powerful learning tools at the service of the student in the process of building knowledge. In a following stage, we will focus our attention on the communication on the global web of information we call Internet and on the challenges schools face today. We will also address the change in the Internet communications paradigm from web 1.0 to web 2.0, in which the user goes from consumer to producer of information. We will finish by presenting some web 2.0 tools and the great potential they offer to educational communication.

Key-words

Education, Internet, communication, web 2.0.

1. INTRODUCTION

Information and communication technologies (ICT), due to the extraordinary evolution of the scientific knowledge, also conditioned by the technologies, have been, in the last decades, infrastructures of: new ways of work organization (tele work, mobile work, combined work with presence and distance actions), production and consumption (e-business and e-commerce), new relations with information, the know-how and the knowledge, making e-learning (distance learning) and b-learning (combined, presence and distance learning) flourish, new ways of social communication, of leisure and entertainment, resulting in an emergence of the e-entertainment and the edutainment (mix of education and leisure),

new proactive ways of participation and exercise of citizenship and the broadening of multicultural relationships. More than just means of communication or neutral tools, ICT are technologies both cognitive and social which, through a networked computer, leave space and unlimited time at everyone's reach, with all its positive and negative aspects.

We live times of fast changes and transformations, that travel upwards, in the path of knowing and knowledge. We have gone from a social context, in which the information was a scarce resource, to another context where the information we access is immense but also fragile and extremely volatile. In the global society of the XXI century, internet is not a simple communication technology but the core of many areas of social, economic and political activity, making itself, in Castells (2004) perspective, "as a technological instrument and the organizational form that distributes the power of information, the knowledge production and the ability to network in any scope of human activity." (Castells, 2004: 311). Such society transformations assume suitable adaptations by the School and teachers, because "A school that closes on itself is not ready neither to learn nor develop." (Guerra, 2001:60). In this context, to try to understand the processes of educational communication within the global net of Internet information is not a necessity but instead an urgency and the reason of existence of the line of thought we come to share in this communication.

2. FROM THE LINEAR COMMUNICATION TO THE HYPERTEXT MODEL

To put into perspective the learning relation and the learning process under the theories of communication is a core issue in the context of the Educational Technology, a scientific area of Educational Sciences that, since the middle of the last century, has as an objective the improvement of human learning with the support of technological resources. In this perspective, the general principles of human communication extend into the classroom and the learning communication will be conditioned by the way in which the teacher knows, masters and practices those principles, to such a point where one could establish an association between learning methods and communication technologies, viewing teacher and students as "communicators" (Moderno, 1992) and also that "The school's work is a communication's work" (La Borderie, 1994:38).

To analyze the educational paradigms evolution under the communication's theories is an exercise that helps to understand the dynamics of the teaching and learning process and to verify how, in that process, the role of technology can help any learning model whether the methods are expositive, project work or problem-solving. So, in the traditional learning logic, we can speak of a transmission paradigm, in which the teacher is the centre of the teaching-learning process and the holder of knowledge and experience; in this same model the student is merely a passive receiver of the information. To Moderno (1992), in the "technically driven" and "linear" logic of the unidirectional communication's model typical of traditional learning – which in communications theories has the parallel in the Shannon's, Weaver's and Lasswell's models (Coutinho, 2005) – the technologies (first the blackboard, than the overhead projector, the audiovisual and later the computer) were used as a set of techniques aimed at easing the message transmission (contents) between "a sender that knows" (the teacher) and a receiver who does not know" (the student), assuming the technology, and we quote "a function of knowledge control and contributing to the increase the efficiency of the learning processes" (Pacheco, 2001:70).

As the result of the intense curricular debates that took place in the 70s as well as the influence of the systemic and cybernetic theories in the learning and teaching process (Branson, 1990), a paradigmatic change in the learning communication process occurs. Education is now understood as a system (and learning as one of its many subsystems), the relations between the entities are valued (management, school, community), the interaction between the participants (teacher and students) and mostly the feedback; the conditions to define a new educational paradigm were created, characterized by a model of bidirectional communication, in which the teacher loses part of his/her importance in favor of the valued role of the student in the learning communication process; media transforms itself from assistants to "educational technologies" used for communication and learning to serve both teacher and student (Moderno, 1992), favoring interactions, sharing of opinions and the search for interpretations and meanings (Grundy, 1987). But it is with the computer technology development and mostly with the emergence of the Internet that the learning communication faces its biggest challenges. The information technologies created new spaces of communication and knowledge growth (Dias, 2001). The communication in learning ceased

taking place only in the classroom, the school no longer had the education monopoly, turning the contexts of non formal and informal education into lifelong learning spaces (Dias, 2004). There are increasingly more people studying at home, being able to access the distance training cyberspace, searching outside the school space for the available information, in the services available in the internet that can answer to their personal demands for knowledge. Learning spaces are here and everywhere; the time to learn is now and always.

To understand from a conceptual point of view the communicational model network that characterizes the internet, we need to address a new educational paradigm logic (Coutinho, 2005). To Mucchielli (1998a, 1998b), in network communication, the communicative act resembles an hypertext, that is, a set of information units interlinked in an associative net, supported by a computer explored by an individual – when navigating the internet, for example -, in a non sequential way and according to their interests and necessities, and in which the final product (communication meaning/significance) cannot be determined from the start, since each “reading” depends on the way in which the individual searches and actively connects the information in the hyper-textual network, creating its own paths. To the same author, the hyper text model is constructivist because it considers communication as a “latent” and “hidden” debate in which the “meaning” is not defined from the start and results from an individual’s personal construction established on a knowledge basis (Mucchielli, 1998a). On the other hand the network communication generates a wide range of virtual communities (Castells, 2003), oriented, states Levy (1999), by common affinities and interests.

As for the ICT role, one assumes it as tools of emancipation of several social actors, which means making the decisions level responsible and decentralized, since “It is in the domain of decision, evaluation, freedom, rupture, option that responsibility is set (...) autonomy builds itself in the experience of decisions being made” (Freire, 1997).

These new scenarios demand an holistic approach to the educational process that goes through the integration of technology in the curriculum with the purpose of its own expansion and a more active participation from students in the teaching/learning process (Dwyer, 1995).

To Lazlo & Castro (1995), the key to this new educational

paradigm lies not only in the fact that the learning centers itself in the apprentice, but mostly in the emphasis that is placed in the relation the student maintains with the knowledge basis. The classroom ceases to be a controlled environment, transforming itself in an environment which promotes knowledge building, in the need to learn in a constant and permanent way based in the real and global investigation through the information highways (Ponte, 2001). Work becomes collaborative because it is born from a negotiation between teachers and students in the path to a social building of knowledge and takes place in the fulfillment of projects based on common subjects and related with the students' interests (Dias, 2004)

Through the internet it is possible to fulfill a series of activities that can favor teaching and learning as well as the creation of collaborative and cooperative situations. Lately, the internet has evolved considerably bringing, in an almost daily basis, innovations and, as we will see, many of those innovations can be used in educational communities.

3. CHANGE OF PARADIGM IN THE INTERNET

In its early stage, the Internet served military purposes and the exchange of information between bases, but as an agile and secure mean of data transmission, it quickly became a target for universities and investigation centers which discovered in this tool a way of exchanging knowledge between investigation units from all over the world. Since then, there was a fast and growing expansion of the Internet, which embraced industry, commerce, health and obviously, education.

According to Ravache (2006) in 1994 existed about 10 thousand pages in the virtual web. However, in those days only the ones responsible for each website could insert information on the web. It was the era of the rise of major portals, such as, Sapo, Yahoo, Aol, among others. The web was an almost infinite repository of information, however the content was used in an unidirectional way, that is, from webmasters and web designers to users.

According to Monteiro and Boavida (2000, p.6) the Internet can be defined as “a net of network interconnections”, this computers global net is the larger computer network in the world and allows access to a major data repository which can be accessed by anyone as long as they have the

necessary equipment. The means of access can be established cable or without wires through wireless technology (*wifi*).

With the development of the Internet, new communication tools appeared. Today it is possible to do an infinity of things in the Internet, besides having a direct and real time communication with the whole world. As time goes on, the available websites lost their static format, becoming ever more dynamic and interactive to the user thanks to the introduction of communication tools such as the chat, the e-mail and the forum.

3.1 Web 1.0 versus web 2.0

The first Internet generation had as a primary attribute the great amount of information available and to which anyone could access. However the role of the user in this scenario was of simple spectator of the action taking place in the visited page, not having authorization to change or reedit its contents. In this first stage services available through the net appeared and prospered in at fast pace, creating new jobs and economical niches, such as *e-commerce*, which delimited a new standard of businesses for the companies, almost tripling their income. Web 1.0 was quite expensive to its users; the vast majority of services were paid and controlled through licenses, the systems were restricted to those with the buying power to cost the online transactions and acquire the software to create and maintain the websites.

Web 1.0 brought major advances concerning the access to information and knowledge; however the philosophy behind the concept of the global network was always one of open space to all, that is, without an “owner” or individual who controlled the access or the published content. There was always a concern to make this a more democratic mean, and the technological evaluation allowed the increase of the users’ access possible through the upgrade of the broad band connections, through the possibility to publish web information in an easy way, quick and independent of specific software, programming language or additional costs.

With the introduction of this new Internet generation called web 2.0, terms such as Blog, Wikipedia, Podcast, Hi5 or Del.icio.us are just a few examples of tools which are part of the variety of available systems in the global net (Richardson, 2006). Many users, due to the fast process of change, did not even realize that the Internet changed its paradigm. In

fact, today the philosophy is different since, with the introduction of the Web 2.0, people began to produce their own documents and to automatically publish them in the net, without the need of major programming knowledge and sophisticated computer environments. The term web 2.0, created by Tim O'Reilly (2005), first appeared in a brainstorming session, in MediaLive International in October 2004 which considered:

The web 2.0 is the change to an Internet as a platform and an understanding of the rules to obtain success in this new platform. Among others, the most important rule is to develop applications that take advantage of the net effects to become better as they are more and more used by people, taking advantage of the collective intelligence. (O'Reilly, 2005, *online*)

To Alexander (2006, p.33) the web 2.0 or social web (due to his concern with the users participation), “emerges as one of the most relevant components of web 2.0”, that is, it is a way of making the use of the global net to occur in a collaborative way and the knowledge to be shared in a collective way, decentralized from authority and with the freedom to use and reedit, a concept known as *collaborative working*.

Interpreting O'Reilly's ideas (2005), Alexander (2006) considers that the main features of the Web 2.0 are: rich and easy to use interfaces; the tools' success depends on the number of users, since they can help to improve the system; costless in most of the available systems; easier data storage and design of online pages; several users may access the same page and edit the information; the information changes almost instantly; the sites/software are linked to other applications making them richer and more productive even when working in the same platform (fusion of several applications); the software works basically online or can use offline systems with the option to export information to the web in a fast and easy way; the systems cease to have versions and begin to be updated and corrected frequently, bringing major benefits to the users; the vast majority of web 2.0 software allows creating communities of people interested in a certain subject; the information update is done collaboratively and becomes more reliable with the increasing number of people accessing and updating.

With the use of tags in almost every application, occurs one of the first steps towards the semantic web and the correct indexation of the available contents. The web 2.0 tools can be classified in two categories, that is:

In the first category – are included the applications that can only exist in the Internet and whose efficiency increases with the number of registered users, such as: Google Docs & Spreadsheets, Wikipedia, del.icio.us, YouTube, Skype, eBay, Hi5, etc.

In the second category – are included the applications that can work offline, but which can also bring major advantages if they are online, such as: Picasa Photos, o Google Maps, Mapquest, iTunes, etc.

The number of available web tools which use the web 2.0 paradigm has already an infinity of examples and from those we highlight the following: software that allows the design of a social net (social networking) such as: Blogs, Hi5, Orkut, Messenger; Collaborative Writing Tools, Blogs, Wikis, Podcast, Google Docs & Spreadsheets; tools for online communication such as SKYPE, Messenger, Voip, Google Talk; tools for Video accessing such as like YouTube, Google Videos, YahooVideos; tools of Social Bookmarking such as Del.icio.us.

Web 2.0 stops with the dependence of physical means of data storage, since through the available tools the user keeps everything online in a public or private way, increasing therefore its spread or privileging the security if available to just a restricted number of users.

The Web 2.0 philosophy takes a stand because of the easiness in publishing and storage speed of texts and files, that is, it has as main objective to transform the web into a social and accessible environment to all users, a space where each one selects and controls the information according to its necessities and interests (Greenhow, 2007). In terms of potential for the educational communication, three web 2.0 tools have deserved the growing interest of teachers and investigators who do not cease to advocate for its enormous potential; we refer of course to blogs, wikis and podcasts which will be the target of our analyses in the next paragraphs.

4. SOME WEB 2.0 TOOLS

Blogs, wikis and podcasts are the Web 2.0 most spread out tools and used in educational contexts. In fact, there are several studies made recently both in Europe and in other continents on the educational use of

blogs and wikis (Martindale & Wiley, 2005; Du, H. S. & Wagner, C. 2005; Brescia & Miller, 2006; Coutinho, 2006, 2007; Coutinho & Bottentuit Junior, 2007b; Coutinho & Bottentuit Junior, 2007a).

The term **blog** or weblog, according to Gomes (2005, p.311), “is a web page that is supposed to be frequently updated through message postings made out by images and/or texts presented chronologically”. The blog is the ideal tool to be used for the discussion and exchange of ideas in the web, for the creation of true communities with similar interests around the most diverse subjects. Blogs can be used individually or collectively and are very versatile in terms of learning exploration, very easy to conceive and update, hence the enormous popularity and growing interest in evaluating its educational potential. Gomes (2005) considers two categories for blog use: a) as a learning resource, and b) as an educational strategy.

Another web 2.0 tool that is raising the interest of the educational community is the **wiki**. The term wiki became very popular after the appearance of the Wikipedia which grows every day with the voluntary inputs from experts in the most diverse areas of knowledge.

A wiki is a website for the collective work of a group of authors; its logical structure is very similar to that of a blog, but with the added function that everyone can add, edit and delete contents even though they have been designed by other authors (Schwartz et al, 2004; Tonke, 2005; Qian, 2007). Santamaria & Abreira (2006) give to this tool the following educational potentials:

- Interact and collaborate dynamically with students;
- Exchange ideas, create applications, suggest work guidelines to particular objectives;
- Recreate or create glossaries, dictionaries, text books, manuals, class repositories, etc;
- See all the historic of changes, allowing the teacher to evaluate the registered evolution;
- Design structures of shared and collaborative knowledge, which triggers the creation of learning communities;
- Integration within the edublogs because, although distinctive in terms of design, they can be integrated in a complementary way.

In a global world where time is increasingly scarcer, the **podcast** appears as an alternative technology for the support to either distance (e-learning) or presence learning category. It allows the teacher to make

learning materials available, such as lessons, documentaries and interviews in audio format that can be listened at any time and in different locations. In that sense, the podcast has a series of particular attributes that can be taken advantage by a large number of people who need training but have very little time to study and attend classes.

Because it is a relatively new technology, with numerous possibilities to be explored, the term continues still very associated to the simple availability of musical programming which was in its origin. In fact, the term podcast results from the adding of the words Ipod (device of audio/video reproduction) and broadcast (method of data transmission or distribution), hence the association mentioned. However, this reality is changing because the podcast is being used in the most varied contexts, either in the scope of businesses as a way of making available the contents of the meetings, news and entertainment programs, scientific programs and also in education where this tool starts to be used with a growing success for the transmission and availability of lessons, particularly in distance training (McCombs et al, 2007; Pastore & Pastore, 2007).

We now present other less known and still little investigated Web 2.0 tools, but that we consider having a great potential for e-learning 2.0 purposes.

One of these tools is the **Google Calendar**; which is an online agenda and calendar service provided by the Google Company. Available in a web interface, it allows adding and controlling events, commitments, share the programming with other people, aggregate several public agendas to its own, among many other functions. This tool will be able to serve in several educational activities to schedule several presence or at distance appointments, as well as sending SMS (*short message service*) notices when certain events are close to occur, making this way all the intervening ones informed of the number of registered absences/attendances; in the same way, it will be possible to decrease significantly students forgetting dates due for sending works.

Docs & Spreadsheets is also a Google tool that allows the students to edit texts, design calculation sheets and electronic presentations without having the need to install Word, Excel or Power Point in the computer. One of the most peculiar resources of this tool is the document portability, which allows editing the same document by more than one user, as well as the resource for direct publication in a blog. This tool

could be used in a way so the students can work in a collaborative way, allowing or restricting the access to the edited documents by the members of the group.

Google Pages also belongs to Google and is a tool that allows students to design online pages without requiring significant computer knowledge. The system resembles itself to a text editor and, therefore, in a quick and simple way, students can create websites or digital portfolios which can work as repositories of the materials developed during a course or subject.

Del.icio.us is a tool that allows the design of a collection of links in the Web; is very similar with a browser's favorites, with the plus of being online and being able to be shared with all the classmates. Other of the advantages associated to this tool is that it informs others who used the same hyperlink, as well as the tags that organize the links which makes the search by subjects much easier. In a tutorial system, this system could be useful for the design of a library of links related with didactic contents of the different subjects.

Messenger, Skype and Google Talk are highly functional programs and allow data exchange (voice, image, text) in real time with speed and at the lesser cost possible. The cost was the key factor to the success of these applications, as the value of a call is hugely reduced in comparison with a conventional phone call and there is still the advantage of being able to use this program for voice communication from one computer to another, reducing the call price to zero.

These are just some of the tools we can use in e-learning 2.0, since new tools appear or are improved everyday, the big challenge now is how to use these tools in a way to design platforms, which are also called mashups, that is, to design environments where several tools and services can be used in combination.

5. Final Considerations

This article had as primary objective to show how educational communication evolved from an unidirectional model to the multidimensionality of net communication, in the context of the Information and Knowledge Society. Special attention was given to the change of communicational paradigm in the core of the Internet – from Web 1.0 to Web 2.0 – which views the user not only as a simple

consumer of information but as an active producer and participant in the collaborative knowledge building.

Communication in virtual environments is important for teaching and learning in the context of the global society we live nowadays. In these new scenarios, the use of technologies, namely the Web 2.0 tools, makes communication even easier, since there is no need for the students and teachers to have many resources or special knowledge to make use of its great learning advantages. The Blog, wiki and podcast are just a few examples of the vast range of communicational tools we make use to create new scenarios and environments (real or virtual), rich and promoters of a multiplicity of learning experiences. The investigation already conducted shows that these new tools can revolutionize the way we learn, considering that its application aims broader objectives, promoters of interaction and joint knowledge building, which, by itself, represents a new *learning culture*. We hope this communication contributed to open new leads and push for new experiences and challenges to be assumed in favor of new forms of communication and learning.

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