I. E-LEARNING AND LIFELONG LEARNING

HOW SHOULD WE TEACH, IN THE SCHOOL OF THE FUTURE?

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Abstract:During a life time we across several stages of learning and teaching, if you want to be a good student you must: Learn how to learn; learn and learn. But if you want to be a teacher you must had more skills, like: Teach how to learn; Teach and teach; Teach how to teach. A student should start by learn how to learn, this means the methodology of learning, which facilitates to be a good student and much benefit of your learning effort. If we consider a constructivist approach, we must consider three phases in three different levels evolution: Defining roles and moulding; Coaching; Built your own knowledge with Support and scaffolding. But before all, we have to investigate, "How does a human being learns" and from that define a proper methodology and technology to teach. Now you can define a student's learning guide. In parallel we must as well define what should be the compulsive and recommended skills that a teacher must have to be a good teach for the "school of the future".

Keywords: e-Learning, teaching, new technologies, ICT, the school of the future

1 – E-EVOLUTION

The technological evolution during the last 7 decades evolve from one "room computer" (Mark I 1943) weighting several tons into a small tiny laptop, weighting less than one kilo and thousand times more powerful than his "grand, grandfather".

This technological revolution was followed by an enormous change in methodologies and didactic tools in a view to their implementation.

In two decades we build up information, communication, interactive and mobile society we are living today connecting civilizations in real time across the planet.

This results in an enormous sociologic impact in all scientific areas, as well in education processes.

The social profile of our students has also changed. Students average age has increased, because of the: "4 years of university basic education are just an introduction to 40 years of long life training" Lima J. (2004).

There is no doubt that students today are building their own knowledge, demanding more interactivity, more multimedia contents, they are more Web dependent, more surface learners, and wiling for more mobility, better didactic communication in presence and distance learning.

This is because, they are digital constructivist learners, multi intelligent, (Gardner and Flaming 1986), emotional behaviorist learners (Daniel Goleman 1999), interactive learners (Alcino Silva 2001) and they are collaborative social virtual learners (George Siemens 2005).

This results into a new way of teaching and learning, with new technologies and new methodologies, that we can call "the school of the future".

Although teachers are better and better prepared in their scientific area and a large amount of investment has been made in the last decades in new technologies and methodologies, teacher´s skills are short in fulfilling all education requirements.

The questions today are:

- − Are we, teachers, prepared to offer it?
- − Do we have the right skills?
- − What are the best technologic tools, and the best methodologies to do it?
- − Is e-learning a solution? Or just learning? (To be used in both presence and virtual environments).

Enormous amount of training, research and reflexions has been done to answer these questions.

2 - HOW DOES A HUMAN BEING LEARN

Human beings have different learning styles, are multi modal learners, asking for more multimedia contents and distance learning. Let us identify these profiles.

2.1 - Characterization of behavioral profiles and learning styles

Each person has different characteristics and behavioral profiles and requires careful classification in order to find the most suitable learning process.

But also their own individual learning style profile varies during, the physiological life cycle, and according to the moment of the learning cycle.

Sarah Corneluius (2001), identifies two very important aspects to take into account: a constructivist approach and personalized education, which consists in the fact that this should be the perspective of the student, "just in time" and "just for me".

This assumes important job identification by the tutor as to the student's profile and its behavioral attitude in terms of typifying profiles and how they learn, and then to be able to set up a teaching approach in terms of learning objects, strategy, educational contents and techniques.

One of the ways through which any student can be identified is by their "learning style".

Keefe features "learning style" as follows:

... "Feature cognitive, emotional and psychological behavior, which serves as indicator for the stable learner, learns, interacts and reacts in the learning environment" ...

Honey and Mumford (1985) stated that ... "the learning style affects how the learner receives and assimilates information" ..

These aspects are therefore extremely important as work elements for the implementation of the tutor´s work in the teaching process and hence the optimization of individual learning process.

Work is needed to identify important learning profiles of different students, especially when working with relatively large and heterogeneous groups (class) where a responsive educational model to fill out a greatest common divisor of the group learning.

There have been several attempts to classify learning styles and have been pointed out several criteria and grids.

The most common classifications have been the following:

- Active, reflective, experimental and theoretical;
- Superficial and deep;
- Visual, auditory;
- Tactile and kinetic.

2.2-Our students are digital learners

- Sociological and behavioral changes of students.

Today in the twenty-first century, the dependence of television, computer games and communications predominantly audio visual meant that our students are eminently "digital learners".

The lack of interest and motivation of our classes, has been pointed as one of the factors of school failure.

- More than 10,000hours playing "videogames";

      (inter active gaming, media scope, June1996);

- Over 10,000hours talking on cell phones;

      (Prensky2001, Digital Natives, Digital Immigrants);

- Approximately 20,000 hours seeing TV;

      (Prensky2001, Digital Natives, Digital Immigrants);

- Children and adolescents spend more than 2.75hours / week on the PC;

      (Institute of Social research, 2004);

- In 70% of countries almost all children from 4to 6 years have used PCs;

      (KaiserFamilyfundation2003);

- Every day, 68% of children over 2 years spend more than2 hours a day with digital games;

      (Kaiser Family Foundation2003).

Our students are not motivated because they consider that what is taught in school is of little use for their future success:

- 21% of students completing the course consider it to be interesting;

- Only 39% consider that that school work may have some interest for their future success in life.

The failure of the current model of school is reflected in the fact that: 79% of students consider that the courses are "not interesting" and that 61% faced "school work with little or no concern for their future practical life."

However, these data refer only to the opinions of students completing the courses, if we consider also the students who dropped out, the results would be far more compelling.

2.3 - Mapping the brain and multi-channel learning process

Studies in the field of neurophysiology carried out in the late 90s and in this decade, such as the ones performed by Antonio Damasio (1995) and Joan Stiles (2006), consolidated and completed studies started in the beginning of last century on the brain areas associated with each vital activity such as perception, understanding, vision, speech, hearing, emotions or thoughts, by Brodiman (1909). These studies complete the cataloging and mapping of the human brain and its implications in the process of acquiring knowledge, introducing new factors in the rationality learning theory.
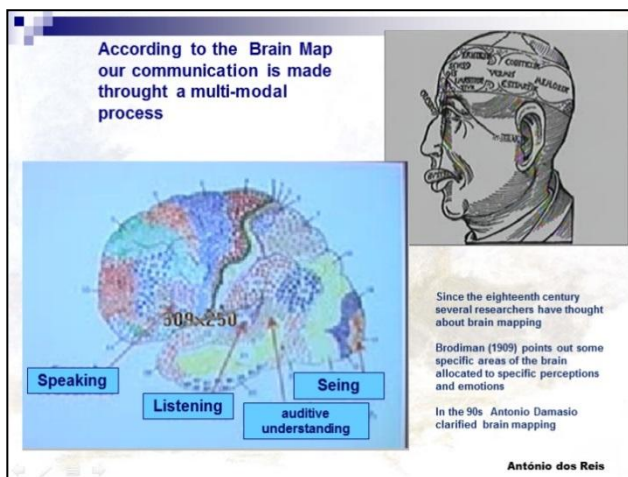
Figure 1. – Brain Maping

Source: A. Reis

The brain understands the phenomena that surround us in different areas of perception; this means that when the communication process is received in the working memory and performed it is directed through different areas of the brain and through different channels that facilitate the learning process. After as meta cognition process, it takes place the creation of synapses, which provide cross-links neurons and the optimization process of information available creates conditions to enhance the activities and developing the reflective target cognition and to memorize it in long term memory.

Joan Stiles (2006) states that the human brain has about 100 billion neurons, which can be developed over 60,000 million synapsis.

This approach expands and enhances the process of didactic communication, thus giving greater weight to each of the instruments it incorporates and requiring a teaching effort to improving the mastery of various techniques for exercising their profession in an effective and responsible manner.

Corneluius in Fleming (2001) concludes from responses to a survey on the model VARK (visual, audio, read/write, kinetic), cited above, that about 60% of students take multiple and evolving capacities, as the style of learning.

Which leads McKenzie (2000) to conclude, commenting Creanor, quoted in Corneluius (2001): ... "in theory presenting content synchronously in different formats simultaneously, we possibly create conditions for our students understand and memorize better" ...

But teaching at school level (according to the analysis in 2010) continues to rely largely on oral transmission almost exclusively.

If we take into account that some classical studies, but with some reservations and relative values (Flores 2009) point to different levels of information retention depending on how it is transmitted to us, ie, we retain:

10% of what we read.

20% of what we hear.

20% of what we see.

50% of what we see and hear simultaneously.

90% of what we say and do.

We can conclude that about 80% of which is exposed only by the verbal form, by agents of education is lost.

It is therefore important and urgent, to implement the extensive use of multimedia tools in teaching, if we want effectively improve the transfer of knowledge and consequently its quality.

The fundamental conclusion is that the didactic communication process should be enriched by means of multi-channel communication, with the aim of facilitating the process of acquisition of knowledge by the student and better and more efficient teaching.

2.4 - The importance of the image in knowledge transfer

The image has been an important tool in knowledge transfer. Antonio Damasio (1995) expressed it by:

... "No one will deny that the thought certainly includes words and symbols. But what does not account for this statement is the fact that both the words and other symbols are based on topographically organized representations and are themselves images "...

But if we follow an inductive process completion will be no different.

Since the earliest times and in all cultures that man has used the image as a tool for knowledge transfer.

Both in terms of prehistoric cave paintings, Persian cultures, Egyptian, Chinese, Japanese, Indian, Inca, Mayan or Aztec, as in antiquity, middle ages and renaissance.
But it is with the advent of multimedia technologies and domain that the image takes on a dominant role and becomes key in the process of transferring information and knowledge.

Today television habits lead to almost everybody in one way or another absorb important part of the information through media.

Figure2. - Pictographic communication in different cultures and times

Source: A. Reis

Labour (2000) concluded from their studies that about 65% of the students are "visual learners."

The Internet is a means of excellence for delivering content, with riche pictures, in addition to text or still image with sound or films

Gómez (2003) states that ... "the Internet provides a bridge between school culture and audiovisual culture outside" ...

It should be noted that however that it is generally agreed that the image and multimedia do not replace other forms of communication, such as writing, which is not alternative but complementary.

It is therefore essential to integrate the processes of image presentation, in content for all levels of education, whether it is expressed in a static or animated form, vulgar films, so that the learning process is facilitated and optimized.

2.5 - The interactive process, reflective and iterative learning

Alcino Silva (2001), a researcher in the field of neuro-physiology (LA. University – USA) presents the results of its investigation to characterize the learning process of the human brain, in view of this scientific area.

From his work it can be concluded that interactive activities and reflection results ahormonal process changing that determine a memorization on a permanent basis in the human brain.

In an easy way we can say that the human being, receives information in the "working memory" in a passive, unstructured or organized form. When in a certain moment that there is some phenomenon, a "Clik" that alters the mental state and

consequent causes hormone production (testosterone, endorphins oxiocitins and others) and start to memorize in short term memory.
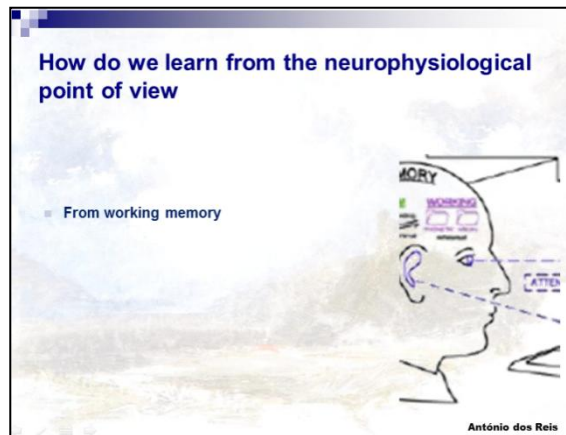

Figure 3. – How do we learn from the neuro physiologic point of view – step one – working memory

Source: A. Reis

In the next phase, the receiver performs a very short reflexive action, that leads to reject and erase, or if it is considered important, the received information held in working memory (or short-term), will be integrated through a meta cognition process in long term memory, using a logical or emotional process.

If the first part of the process is a quite fast one, the meta cognitive process, may take a long time of reflection.
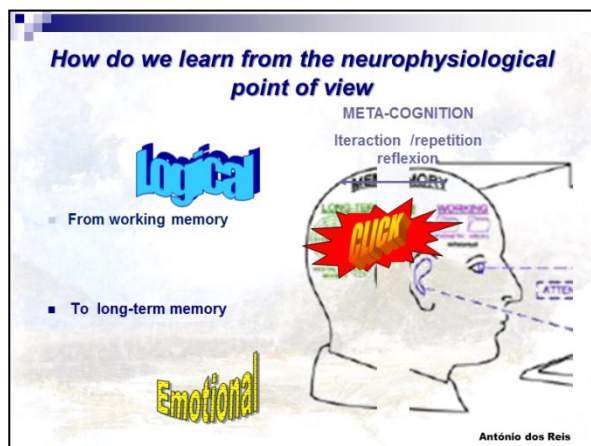

Figure 4. – How do we learn from the neuro physiologic point of view – step two – long term memory

Source: A. Reis

What is really behind this approach again in relation to cataloging classical "traditional theory (behavioristic)" and "current theory (constructive)," which replaces one another, is that both theories coexist. They are only separated by the state of knowledge in which the learner is whether this state of knowledge is related to the point of the life cycle in which it is either the point of the state of knowledge that is in relation to a particular subject or learning process.

3 - THE LEARNING ENVIRONMENTS

3.1- The Distance Learning stages

We can find references to distance learning since the 18th century (Verduin & Clark· 1991), although in practice it was not used regularly up until the mid 20th century in the USA and some European countries.

The Second World War forced an important increase in distance learning, because many young people incorporated in the war needed to go to the front line and simultaneously many of them have to be replaced in their civil jobs with no trainers or tutors available.

On the other hand, when the war was finished all the young people had to be integrated back in professional civil activities.

It is in this scenario that since the mid-forties Skinner starts to talk about the "Teaching machine", but in that period he did not realised what type of "Pandora box" he was opening.

Skinner introduced in 1954, CAI (*Computer Assisted Instruction) in his classic article ('The science of learning and the art of teaching") he summarizes the basics about "The teaching machine". The teaching machine and the programmed texts, are the previous format of CBI (computer based instruction) turned into reality later with the PCs.*

http://www.virtualeduca.info/ponencias2009/381/Conductismo,%20Cognitivismo%20y%20Dise%F1o%20Instruccional.pdf

For the development of educational programs it was necessary the analysis of tasks and objectives. In 1956 B. Bloom published the conclusions of his research on: "The taxonomy of educational objectives". Distance learning evolved in different stages (Moore and Kearsley 1996) following the development of computers, multimedia and Internet. On the other hand, technologies evolved gradually in number, complexity and potential, offering new models of distance teaching and learning (Chute et al. 1999).

1 First distance learning stage (-» 1970): courses contents were totally delivered by regular mail

The pedagogic approach followed for this stage and the two subsequent stages were totally behaviorist. In this stage, we saw the first training courses presented in the radio (1930) and television (1954).

2. Second stage (1970 -1980): Open Universities

Despite what has been pointed out by Skinner and Bloom in the fifties, it was in the seventies that the theoretical bases for distance learning flourished, particularly as the result of the "World Conference for Distance Learning", coordinated by Wedemeyer 1972.

In 1969 the "UK Open University" was founded and Bloom was one of the consulting advisers of this project. "UK Open University" is known as one of the most relevant projects in this area and a model for many other experiences that took place all over the world during the seventies and eighties (Daniel 1996).

Michael Moore (1973), suggested that some resources should be allocated to defining the research areas, identify different types of distance learning and to build up theoretical methods.

3 Third stage (1980 - 1990): Video cassettes and TV

The rise of video players, satellite and cable communications enhanced the importance of TV and video communication in distance learning. The audio and image quality of the contents was very fair and video players were offering the possibility of students to attend lessons "anytime, anywhere" and how many times learner needed.

Since 1985, different sets of courses were offered with a remarkable success.

4 Forth stage (1990 - 2000): Computers, multimedia, interactivity, e-Learning

Technological evolution of digital equipment and software showed new possibilities of interactivity and improved the quality of distance learning.

CD-ROMs and Internet (1990) were two important innovative tools, offering flexible learning, allowing anyone to use virtual learning environments irrespective of the place or time-zone where they are. In addition, new communication systems based on Internet, started to offer the potential of interaction among students, teachers and specialists across the world.

This period marks the rising of the system - the beginning of multimedia contents production, communication and distribution using LMS.

One of the most important aspects is the evidence of a need for new methodologies in parallel with new technologies.

Some proposals in this area have been presented since the early nineties:

   a) Moore (1993) considered the "curriculum" as a "structural" area and the constructivist "dialog" as a need;

b) The "student autonomy",   was highlighted as important and called "transactional distance theory", from Dewey "transaction" concept, which was later developed by Boyd and Apps.

There is a large consensus about the definition of distance learning. The focus is the physical separation between students and the teacher during the learning process (William, Paprock, Covington 1999).

One of the most coated distance learning definitions produced by Moore and Kearsley (1996) states: in the courses the teaching and learning process is running in separated environments and it is necessary special techniques over the curriculum formulation, teaching, communication, organization and administration. However, it is also important to point out that it is based on new methodologies that the learning process takes place and becomes effective.

A new vision for using more interactivity, multimedia, graphic animation, audio, and video (steam video 1997) hypertext, and communication over email, chat and "focus groups", was the dream of many authors and course coordinators in that period, but still difficult to implement.

Students started to be seen as active partners, using different technologies.

In fact the use of this format was very limited until the mid of the first decade of the 21st century, mainly due to short bandwidth available and its high cost. Also, the technologies available were being used without being supported by adequate new methodologies, which might have turned distance learning activities into "technological noise".

There is a final question: What is e-learning today?

3.2- Online Learning Environment

Back in 2000 when we talked about e-learning we were certainly talking about distance learning.

However, when we talk about online learning today, are we exclusively talking about distance learning? Not necessarily!

Today we can be talking about distance learning supported in presence activities or presence learning supported in distance / online activities.

In fact, we are in the presence of an emerging concept in constant evolution.

The increasing use of online tools in presence teaching makes online tutoring as a daily support tool with excellent results to improve the learning quality.

What are the changes that justify that?

We could see that the nineties were a break-even period for a qualitative change in distance learning. Important technological evolutions, software development and communication facilities occurred during this period, particularly, the development of very fast CPU's, allowing video and audio editing. Hard discs, with very high

capacity and rotations above 7.200 rpm, able to capture video, "stream video" available after 1997 diffused over the Internet (1990) / WWW (1991), video projectors, etc.

Software to produce audio and video contents and presentations became available.

However, only after Internet was available with sufficient bandwidth and at an affordable price (in the first decade of 21st century) it was possible to start using it for education purposes. Video conference tools were available in acceptable quality and prices for education 1x1 or "many to many" in the format of virtual classrooms, after the year 2000. On the other hand, because of its high cost, only after 2004 open source LMS platforms used at all education levels became available.

3.3 - e-Learning evolution

World education evolved from kindergarten to postgraduate degrees or to long life learning.

The reasons pointed out for this are the political pressure over school results, the imaginary usage of ICTs, the challenges the Bologna methodology brought, and the common use of computers, social networks and 3D environments.

The learning theories of the digital era emphasize the importance of asynchronous interactivity (related with Web 2.0 (Downs S. 2004) and (O´Reilly 2005) as well as synchronous interactivity, collaborative work and the inducing connectivism (Siemens G. 2005). Later, this is accepted as an evolution in the learning processes based on technologies, and the mobility in the collaborative and informal learning.

Daniel Goleman (1999), in his "Emotional Intelligence Theory" suggests the use of pedagogic games and other emotional intelligence activities to increase the learning quality.

This emotional oriented approach opens an opportunity to use 3D environments as eligible and valid tools for the education proposes.

From our experience in using Second Life and Active Worlds, we consider it to have good potential, but some didactic limitations, particularly in MUVE platforms when used in some education environments.

According to the needs of our student's profile, teachers should update their technological and methodological skills. This requires permanent training in areas like:

- new collaborative learning methodologies;

- online tutoring, on the use of virtual classrooms, video conference tools and virtual group work;

- tools, to produce contents in multimedia format, pedagogic games, the use of interactive synchronous and asynchronous tools;

- know how to use online platforms for managing contents (LMS) and other supporting interactive animations like 3D and MUVES;

- Continuous formative assessment;

Rosenberg (2001), emphasized that teaching today means different forms and formats, like presence teaching, online teaching, virtual teaching, blended teaching and other.

According to García et al - (2007), Bernárdez - (2007), Bernal - (2007), there is no sense in trying to develop opposite terminology and make the "black and white game". It is much more important to integrate the differences and complementary but mainly to improve teacher's skills.

An interesting study ordered by the US Government about online education, important rules and methodologies about it are important (Means, B. Toyama, Y. Murphy, R. Bakia, M. Jones, K. May 2009).

According to Means B. (2009), "online learning" is "learning totally or partially using Internet. This definition excludes: printable documents, the use of TV or radio".

This definition is not consensual. Some other authors use a broader definition accepting a large use of different electronic equipment - more or less what is usually called today as "online learning" or "e-learning".

The e-learning definition has changed over the years and included different contents, but always expressed a relation between learning and the use of computers.

The first used names were CBI (*Computer-Based Instruction), * CBT (*Computer-Based Training) or * just CBL (*Computer-Based Learning).*

During the nineties e-Learning was referred as distance learning.

In 2001 Rosenberg, introduced a reflection about the separation between distance learning and e-learning, saying: "e-learning is one format of distance learning, but distance learning might not necessarily mean e-learning" …

Rosenberg, wanted to "separate waters": on one side, distance learning supported by documents sent by post or other traditional means - not being what we understand by e-learning today; and on the other side, teaching and learning supported by electronic equipment and tools.

Today there is the consensus that e-learning incorporates online tools and techniques, with contents distributed in multi modal format (printable, videos, audios documents etc.) using interactivity in asynchronous or synchronous tools using virtual classrooms or in presence or distance teaching.

In this regard, some authors says: "the revolution introduced by e-learning, lead that even in presence classrooms, learning will never be as it was in the nineties".

As such, in the beginning of the 21st century e-learning evolved into a blended format: comprising presence and distance learning broadly called b-learning.

We can say that this was the end of distance learning in its pure format. For long duration courses, from a pedagogical point of view, it is convenient that learning is completed in a mixed format by synchronous activities: presence and distance format.

But in a short period, with technological improvement, particularly over increased bandwidth availability, communication and video conference software and better teaching skills, the possibility of using virtual classrooms and synchronous activities can arise as a full alternative to presence learning.

What we have today are contents distributed asynchronously and tutoring in presence or virtual format.

This approach is being done according to Web 2.0 recommendations.

3.4 - E-Learning stages – from e-learning 1.0 to e-learning 3.0

Today the focus of the debate is: "e-learning stages".

During the last decade, the concept of e-learning changed and evolved. It can be typified in three different phases, which can be distinguished by: the presence of interactivity or not; the existence or not of multimedia contents; and the existence of synchronous and asynchronous online support.

The evolution of technology, pedagogic methodology and teachers skills allow us today to use all the above mentioned approaches.

This systematization is a result of our research and was presented and debated for the first time in 2008 in Argentina – Cordoba Learning International Conference and in November 2008 Russia at Izhevsk University International Conference

We decided to promote collaborative research involving several colleagues (Florentino Blázquez, Sixto Cubo, Xabier Basogain and K. Olabe) from that we have presented a communication at London University in World Mobile Symposium – March 2009.

This subject has been submitted to several debates and international conferences such as.

First e-learning Stage 2000 –

e-learning (1.0) – Courses were structured in a self-learning format and only lectured virtually (distance learning). Contents were distributed in pdf or word prints and no interactivity existed. At the end of the course, students were normally subject to final presence examinations.

Very early, students and teachers realized the limitations of this approach and a mixed solution of presence and distance learning was recommended - usually called "blended learning – b-learning".

Second e-learning Stage (2004)

e-learning 2.0 - In 2004 Stephan Downs and O´Reilly started presenting their ideas about Web 2.0.

Stephan and O´Reilly, called for a more dynamic WEB and stressed the importance of interactivity with important repercussions in education environment.

A major important topic was the interactivity and multimedia content in asynchronous format. Teacher – student; student – contents; student – student. The tools available for synchronous activities like virtual classrooms or video conference were few and very expensive and they required quite a high bandwidth.

The content was mainly distributed using the following tools: forums, chats, wikis, blog all of them using asynchronous format, integrated or not in LMS (Stephen Downs 2005, 2007, 2009 y Tim O´Reilly 2005).

Third e-learning Stage (2006 -»)

e-Learning 3.0 - The technologic evolution, mainly related to communication tools it was a relevant factor for the third stages. Video conference and virtual classroom software are offered at much lower prices and require much less bandwidth. ISP suppliers offer sizeable bandwidth at fair prices. Simultaneously, LMS platforms are being offered at "open source", like Moodle, Joomla among others. From a technological point of view distance learning requirements are now fulfilled in good conditions in earlier formats. This means that there are available asynchronous distribution and a need of communications tools for synchronous online tutoring.

Now, we are facing a new quality challenge on distance learning. It doesn't matter if it is called CBL, ICT, e-learning, online learning or any other thing, technical tools are available to work with quality at any education level.

Everyday better and better tools are being offered to facilitate the teacher's job and the students' learning. But, learning and teaching tools require more skills from teachers and students and new methodologies.

In 2006 Stephan Downes, presents a new view over a web 3.0. This view includes that the Web should be more effective over browsing and searching in terms of semantic and obtained results, although, the relation between his "future view" and education science was short.

In 2006 we could again say that we were facing a new phase of e-learning.

e-Learning 3.0, which emerged from "connectivism" based in the George Siemens approach, which includes mobility, multimedia contents and online synchronous interactivity.
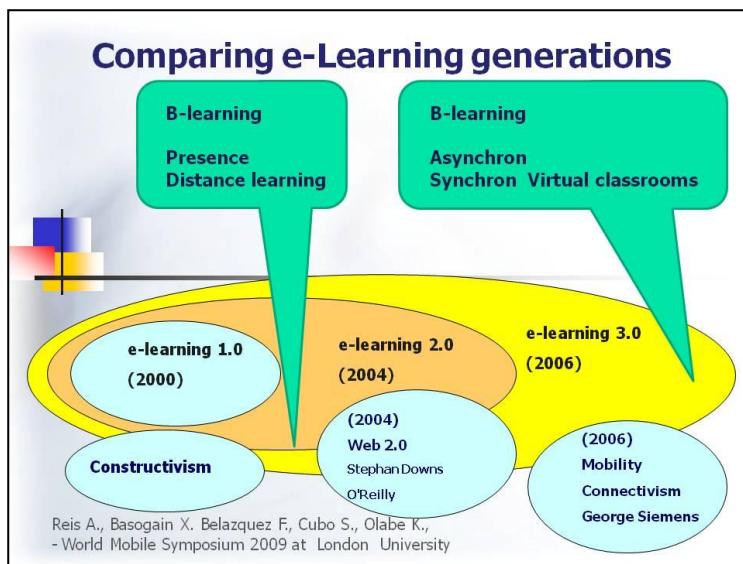
Figure 5. – e-Learning generations

Source: A. Reis

The main aspects used in this environment are:

–   The use of new technologies supported in new methodologies;

–   The use of LMS to distribute asynchronously contents and manage courses, in distance and presence learning;

–   Online synchronous tutoring support, using audio, video, white boards and other tools in virtual classrooms;

–   Continuous formative evaluation supported by online activities;

–   The Blend learning concept has changed from a mix of presence and distance learning into asynchronous and synchronous activities, whether if in presence or virtual format using virtual classrooms;

The main synchronous virtual tools used were: virtual classrooms, e-round table, Webcast, video diffusion, e-workshop, conference call.

Hart (2008) identifies three stages of e-learning and associates them with Web 1.0, Web 2.0 and Web 3.0. In fact, he could establish a relation between Web phases and e-learning phases.

–   Basogain X. (2009) reports that: "In (Reis et al, 2009) the formulation of e-learning 3.0 by Reis, is different from Downs, because he introduces a pedagogic environment and the new e-learning stages includes several didactic tools also used in presence and distance learning"

The concept of b-learning has also evolved from face to face and virtual, to asynchronous learning platform supported in as (Moodle, Blackboard and others) and synchronous formats in their virtual or presence. All, strongly supported by multimedia contents, interactivity in online tutoring and synchronous virtual classroom and formative assessment and reported in communications in international conferences.

Also, mobile learning is seen today more as a complementary tool rather than an alternative tool. The results obtained from our research on this subject were presented at 3rd WLE Mobile Learning Symposium, Institute of Education Sciences at the University of London.

Table 1.

Summarizing e-learning stages

	Distribution Asynchronous Contents	b-learning presence / distance	Interactivity		b-Learning Asynchronous/ Synchronous	Multimedia
			Asynchronous	Synchronous		
e-Learning 1.0	Y	N	N	N	N	N
e-Learning 2.0	Y	Y	Y	N	N	Y
e-Learning 3.0	Y	Y	Y	Y	Y	Y

A relevant aspect that should be pointed out is that the change from phase one into the next did not eliminate the didactics of the previous, it only introduced new didactic tools, new methodologies and build a richer learning environment.

The focus is on questioning much more than just technologies, it is in introducing new methodologies and new skills to frame the educational process, to respond to a set of new needs of our students in online learning.

The solution includes a set of virtual classrooms, techniques and processes that characterize what we can call "new, ICT".

4 - HOW SHOULD WE TEACH

Besides of being an expert in a specific scientific area a teacher or a trainer should have pedagogic and didactic complementary skills.

Different skills are necessary to enable teachers to be prepared to be a "teacher of the school of the future".

- ■ **Presenting contents in a structured format with adequate semantics adjustments to the used format**
- ■ **Didactic communication**
  - □ **• Written communication**
  - □ **• Narration**
  - □ **• Visual multimedia presentation / slide show**
  - □ **• Non-verbal communication / gesture / body posture / facial expression**
  - □ **• Specific syntax to each element of lexical communication**
- ■ **Tutoring - didactic orientation, reflectivity and interactivity**
- ■ **Formative continuous assessment**
- ■ **Know-how to use ICTs and didactic tools in education process**

All these different areas are a must to perform as a good facilitator and using the necessary good practices.

5 - TSSF – TEACHERS' SKILLS FOR THE SCHOOL OF THE FUTURE

In 2011we began a series of debates entitled "Teacher Competencies for the XXI century". This round of discussions was held in e-roundtables, involving experts in the teaching of European origin, North American and Canadian and Latin America and Brazil, being the President of the cycle of debates Prof. Peter Veiga (Vice-Rector of the University of Lisbon), the Chairman of the Scientific Comity Prof. George Siemens (teacher coordinator of Athabasca University-Canada) and António Reis assumed the coordination and implementation of the research project. The discussions were held in three languages, Portuguese, Spanish and English, during a period of eleven months covering the following topics:

- – Basics of computer use, electronic media and the Internet
- – New methodologies and techniques of production and publishing of multimedia content
- – Didactic Communication
- – Tutoring Online
- – Formative evaluation methodologies and tools

- General on new methodologies

- Placement in different levels of education

- Placement in different geographical environments and cultural education

Full details on the project can be seen on the Web sites: http://olcw.thegraal.net/ TSSF/index.html

On each topic there was a debate held in the virtual environment and in-roundtable in each of the languages of the project, followed by discussion forums, publishing online survey, summary and conclusions of the quantitative and qualitative data. The videos of the sessions, and feedback from forums and surveys can be viewed at:

http://thegraal.ccems.pt/course/view.php?id=90
At the end we present the general conclusions of the investigation in an international conference at the Udmurt University's in Russia.

Final conclusions summary.

1. About the future: The future is now. It will be today, tomorrow, next year, in 5 years or more, depending on each one, but it will be;

2. About different skills in different environments, we can say that Internet made the world flat and globalized. To give the same opportunities to our sons, daughters, and grandchildren we must offer them the necessary toolbox for a global competition;

3. The main reason for the changing is: Our students have changed! Not only the technologies and the methodologies;

4. Everything is changing and speed factor is incising, more and more each day;

5. Besides of being experts in one or more scientific areas, we teachers and trainers need to get a pedagogic and didactic toolbox of new skills.

- Obligatory methodological and technologic skills;

- Recommended skills.

New skills are:

6. New methodologies on General environment of theories and methodologies of teaching and learning; Self learning approaches on techniques; Learning styles and teaching process; Objectives and teaching taxonomies; Teaching methodologies; Presence pedagogical techniques versus distance techniques; etc.

7. Skills on didactic communication in multi modal communication, using pictographic language, use properly the voice, none verbal communication and adequate semantic for each circumstances.

8.   Skills on producing and using pedagogic contents, like how to make Didactic videos, pedagogic games, blogs, web quests, wikis, The web 2.0 tools, etc.

9.   Skills on online tutoring synchronous and asynchronous. The domain of technologies and methodologies of using LMS and virtual classrooms.

10.   Skills on formative evaluation and assessment. The collaborative learning approach in presence or remotes environments and use evaluation as a learning too.

11.   The use of collaborative learning environments, connectivism and social nets works for learning.

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