Technology Integration at a Crossroads: Dead End Street or New Horizons?

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Abstract
The integration of technologies went through various stages, from exacerbated optimism with over-promises to disappointment with the realities, possibilities and daily practices. Thus, the intrinsically interdisciplinary process of effective integration of the technologies to the university teaching practice is becoming less frequent and dystopian, represented by a throwback or absence of these practices. The alternative to the current model can be a back to the past, not ignoring the technologies, but performing a rereading of good teaching practices, establishing connections and adapting them to needs and local realities. The same technology that massified in virtual form the university can provide the answers and indicate a way back to the quality.

Keywords: digital divide, environments, e-resources, platforms, role models.

1. Back to the past: master classes, blackboard and chalk.

In an increasingly technology-driven world in permanent turmoil and change – scenario where the boundaries between physical and digital realities become increasingly tenuous and ambiguous – the intrinsically interdisciplinary process of effective integration of the technologies to the university teaching practice is becoming less frequent and dystopian, represented by a regression or absence of these practices, becoming an immense challenge for educational administrators.

Many universities remain resistant, averse to taking risks or even do not confer any importance, resources (financial, human, technological), training or structures that support and/or make possible the effective use of technology in their educational processes, although one can frequently observe some experimentation derived from efforts often isolated of certain groups or individual of some professors.

The publication of theoretical work and the events industry focus on the topic to exhaustion, on most occasions without proposing anything new, or suggest alternatives and/or practical and feasible solutions. The more complex is that formal education, by its very nature, cannot follow the breakneck speed of different media and technologies.
To Roth (2011) this is an empty speech which is not echoed among professors and only demonstrates the gap between the ones who conduct research and the ones who teach.

Producing texts and teaching materials – which includes OpenCourseWare (OCW) and Massive Open Online Courses (MOOCs) – doesn't seem to have any value to the institutions. There's no stimulus, much less recognition (institutional, through similar institutions or even from pseudo-evaluators that imagine themselves owners of the truth with respect to the form and content of what should or should not be made). However, many materials produced in this way (Creative Commons) are immensely more accessed, used and referenced than scientific (or pseudo-scientific) publications that usually only serve personal purposes.

In recent years, universities have awarded more prize and merit to the curriculum of the researchers than to the professors. The important thing seems to be just the publication of

scientific articles in magazines or newspapers of subjective quality and which have been submitted to peer review in an attempt to ensure that these articles and publications meet certain quality standards and scientific validity that vary by publication. This orientation was probably correct while scientific research was limited in quantity and quality and should therefore be stimulated with active policies. “However, not attending with sufficient energy the student's training may foreshadow a new spiral of low-skilled (individuals).” (Frías-Navarro et al., 2010, p. 29).

Hazelkorn (2011) emphasizes the growing obsession around the world since the rankings have become omnipresent in the 1990s. What started as an academic exercise became a race with geopolitical implications. In this sense, Salmi (2009, p. 11), comments the challenges of creating world-class universities, citing a “…growing desire to compete for a place at the top of a global hierarchy of tertiary education.”

What is the relation that can be established between getting a Nobel Prize and the publication of articles only in English, with the level of education developed in given higher education institution? Many rankings (ARWU, THE) are absurd (Roth, 2013, p. 34). Not be ranked doesn't mean develop a low level of education and nor can it be interpreted this way, the same way that being ahead of it cannot be interpreted as having an excellent educational level. These are systems that consider only certain aspects in most cases without any direct relation with education and, as is normal in the area, averse to modernism, hindering the entry of new entrants...

This motivated European Union (EU) to launch its own ranking (U-Multirank) on 13 May 2014, using new indicators and measures a wide range of university activities in research, teaching and learning, regional engagement, knowledge transfer and internationalisation (Vassiliou, 2014), (http://www.umultirank.org/).

In a context of crisis and shortage of resources we must have common sense, perform a reading of reality beyond the immediacy, betting on innovation, creativity and heterodox solutions (Roth, 2013). It is only possible to innovate with people who think differently and are open to different proposals and implementations, not necessarily ignoring what is established. Demo (2012) goes further and claims that the institution does not know how to learn, are full of avant-garde theories for others, but they are the first not to use their theories of change. His position is that “Faced with the challenges of the future, this resistance is futile and ignorant because only removes the university of the historical fulcrum, making it less and less relevant.”

The integration of technologies went through various stages: from exacerbated optimism with excessive promises to disappointment with the realities, possibilities and everyday practices. In a certain way, may even be called the Holy Grail of contemporary education – pedagogically and technologically correct – an ideal that we seek, but that in reality we have not reached yet or even will achieve.

Besides the lack of motivation and incentives, professors are forced to devote less time to the core activities (teaching) and disperse in support activities often working in areas diverse of their training and on which they do not hold any experience. This includes bureaucratic management positions, publication (forced by the system, regardless of having something relevant to say or communicate), participation in scientific events (which in most cases has a lot of event and little of scientific), as well as participation of various types of evaluation panels of students or peers (Roth, 2013).

One of the difficulties to properly explore the various technologies in pedagogical practices is the lack of an adequate infrastructure in institutions, able to adapt to different conditions present and future or even catch up on the constant evolutions technological and methodological, as well as meeting the current needs of the new generation: instant messaging and social networks. These contemporary needs usually are linked to the use of tablets and smartphones, online and offline content consumption oriented devices and not its

production, contrasting with the advances introduced by Web 2.0 that allowed friendlier spaces of knowledge building, encouraging authorship and autonomy.

Roth (2011) recalls that many universities, in the absence of proper space for experimentation, travel on the journey of the other institutions trying to replicate ready recipes (as if it were possible) and adopt fads that are always prowling the educational area. There are also those institutions which launch themselves, effectively, in the use of new proposals with the intent, veiled or not, of being pioneers in its use. But, agreeing with the phrase coined for Nokia by Yim (2010), “It's not technology, it's what you do with it.”

Sá (2004, p. 4) reminded everyone that “In the midst of the information society, at the beginning of the 21th century, the inclusion of ICT in education is, in fact, something less implemented than desirable and a subject relatively little reflected. There has been a major concern on the part of the European Union, claiming for a long time the effective integration of ICT in teaching.”

These same technologies, platforms, environments and methodologies that were once considered new by the specialized literature and quickly will be getting old without having been duly appropriated by the institutions or even by professors – with the aggravation that the constant emergence of other technologies can cause unpredictable impacts. As warned Demo (2002, p. 28), “If the technology is not properly educated, can relate to premature aging, rather than renovation, because anything older than scrap, even recent.”

Roth (2007, p. 55) detected that some problems are in the own development of courses that should train and motivate other professors, for those who belong to these teams seem to be convinced that are modern due to the fact that universities provide some resources, systems, technologies, and computers for use of the university community. But, in fact, they are what Pedro Demo calls pretentiously modern. “The doubtfully modern posture would be the one that tries to turn modern what basically remains archaic.” (Demo, 2002, p. 28).

On the other hand, what is done in Italy, about the beautiful revolutionary, democratic and constitutional rule of “universal, compulsory and free education” at all levels? The situation of Italian public universities is similar to what happens in Portugal and Spain. According to Italian law, the fees paid by students cannot exceed 20% of the Ordinary Finance Fund (FFO) that every university receives from the state. This limit has systematically been breached in the majority of universities, and clearly an increase in fees cannot but further exacerbate this situation. At this point only bad faith can justify the lack of understanding of the fate of the university and students. The most logical consequence will be an unlimited increase of university fees and the virtual disappearance of the public university in favour of private foundations and universities of excellence (Benino, 2009).

Pressured by the lack of government resources many public universities have launched to the market (offering services as companies and private universities) in search not only of its maintenance, but survival. This only denotes the neglect of certain states, considered rich and developed, regarding the education of their people.

Certainly public universities need to overcome inertia and obtain other sources of funds to ensure its sustainability. But that does not mean, necessarily, start charging the customers (students).

However, the universities are wasting time, turned inward to their autonomy and a seemingly comfortable situation. But are threatened by unavoidable risks: the chronic underfunding of some states; the growing strategic ungovernability and consequent loss of competitiveness; the decrease in the number of students, high drop-out rates and their consequences in funding; the unsuitability of trainings and consequent loss of social relevance and prestige; the establishment of the European Higher Education Area (EHEA; and the competition of the transnational education (Costa, 2004).

Surely it is possible to offer a product, service, and even courses, including at tertiary level, at no cost to the end user (student) by obtaining other funding sources that don't rely on governments and school fees. Google taught us this, just follow their business model. In this sense innovation becomes imperative, as it can be constitute in the way of implementing new strategies that enable the university a greater contribution to society, a return to those who through their taxes have generated the resources to keep these institutions (albeit underfunded).

In many relevant areas Europe have the latest technology. Why not in technology-mediated learning? What we see is an incredible resistance to this model of education technologically integrated and supported as well as a focus on optimizing the use of the internet to try to replace outdated and ineffective educational systems that remain resilient even in the face of European reform that in 2010 established the EHEA through the Bologna process, among other things, required another way of teaching, with fewer master classes, more tutorials and directed work (Aunión, 2011).

Venice is known for being a crossroads of people, knowledge and cultures. However the current life circumstances suggest, or even require, attention to well-known warning of Vygotsky (1998, p. 130): “Instruction must be oriented toward the future, not the past.”
We may have available the most modern technological means, unlimited financial resources and still not produce anything – or something with quality.

Much of the students' demotivation is due to this gap between the university (always, in some measure, conservative) and the stimuli to which they are continuously exposed outside the classroom. This is not a competition with the different media in technology of sensation (would be a losing battle), but to seek and follow the dynamics of today's world and, at the same time, provide resources for thinking a critical analysis.

Many professors still gives lessons, although nowadays nothing is so didactically incorrect as the action of giving lessons, having a pretence of holding the knowledge, not committing to a program previously approved, including content to be developed (day by day), methods and forms of assessment (Roth, 2013). They confuse quality with presentiality; lack of organization with autonomy.

The vast majority of selection processes of European university professors gives documentary form (curriculum vitae) and not by impartial and transparent public tender. In these processes normally is not provided any assessment of knowledge and skills of any kind not even didactic. And the paper accepts all...

In the absence of didactic training (obsolete or updated), professors from other areas, apart from education, replicate the old and outdated practices they received from their trainers (and often use the same materials they received). Even those who bother to study or develop didactic skills do, usually, with who develops the same retrograde practices.

Innovate in education is an immense challenge since whoever evaluates sees us with different eyes (*status quo*). People who do not want things to change are those who for some reason feel they have a disadvantage in changing. The question is more educational than technological, because the pedagogy remains focused on traditional instructive proposals, not to mention that resists becoming technologically sound (Evans, 2001; Stoll, 2000).

The effective integration of technologies in supporting education is a challenge that so far has not been faced with depth (Moran, 2003). We have done only adaptations, experiences, small changes. Many of the failures can be attributed to this strategy because most often we limit ourselves simply to pave the cow path (Roth, 2011). This *modus operandi* is nothing more than to remain doing something the wrong way, only more quickly.

Integrate and institutionalize the education practices mediated by the different technologies in a particular university is much more than installing a version of Moodle (or any other LMS), performing some training workshops (sometimes not even that) and afterwards, letting the usage depend on the goodwill of each professor.

The lack of quality training for professors, the lack of adequate support to formatting and content production or even unexplained lack of investment and priorities has produced opposite results to those expected (imagined), being represented by total or partial lack of use and even of the outdated existing technologies or even a return to conventional teaching practices.

2. Learning Environments & Platforms

When related to virtual presence or at distance, environments and platforms refer to the same systems that allow some interaction synchronous or asynchronous. In constant update, evolution or revolution; the effective use of these systems – or not – and its suitability to educational practice is something that always stumbles on lack of experimentation free from prejudices. This can be translated as lack of will, lack of interest, lack of motivation, lack of resources, lack of equipment or even lack of recognition.

The blind adoption of determined environment or technology (open source or paid) or even their lack of update (latest versions) is explained by the fear that some innovation or paradigm shift can arise at any time and take by land all the efforts (however slight) in a particular diverse direction or other platform.

The market of Learning Management Systems (LMS) has several, subjective and often unreliable information. The website Capterra compared LMS 263 (v.2 – January 2014) in several respects (Customers, Users, Twitter, Facebook and LinkedIn), (http://www.capterra.com/learning-management-system-software/#infographic).

The analysis of the twenty most popular systems puts Moodle in the first place. Following we find: Edmodo, ConnectEDU, Blackboard, SumTotal Systems, Schoology, Cornerstone, SuccessFactors (SAP), SkillSoft, Collaborize Classroom, Desire2Learn, NetDimensions, Docebo, Instructure, Interactyx, DigitalChalk, Latitude Learning, eFront, Litmos and Inquisiq r3. With respect to the number of clients, the five most installed systems are: ConnectEDU (135 k), Edmodo (120 k), Moodle (87,1 k), Collaborize Classroom (48 k) and Schoology (35 k). And, regarding the number of users, the five most commonly used systems are: Moodle (73,8 m), SumTotal Systems (38,5 m), ConnectEDU (20 m), Blackboard (20 m) and Edmodo (20 m). When the aspect is presence on social networks, the five systems most followed are:
- Twitter: Edmodo (55 k), Blackboard (23,9 k), SuccessFactors (SAP) (18,4 k), Moodle (14,3 k) and Instructure (12.4 k).
- Facebook: Edmodo (38,1 k), Cornerstone (28 k), Docebo (21,2 k), Moodle (15 k) and eFront (8,11 k).
- LinkedIn: SuccessFactors (27,8 k), Blackboard (16,6 k), Cornerstone (12,9 k), SkillSoft (11,5 k) and Desire2Learn (11,3 k).

But when we checked all 263 LMS referenced in research, we started to notice the limitations and tendencies. Besides the little emphasis given to the Sakai system, no reference has been found about the TelEduc (UNICAMP) (http://sakaiproject.org/), (http://www.teleduc.org.br/), (http://www.capterra.com/learning-management-system-software/#all).

The issue is not attempting to define which one is the best system or even the most used. Roth (2004) has been investigating, compared and used different systems. In this sense it would be more appropriate to check how much the majority of these environments literally stopped in time (focusing on messages, discussion forums, chats, mailing lists, newsgroups, websites), the few that really evolved into a new concept – or even those that have already

been created under a new approach – and the main, how little of the resources are actually used. Hardly anyone who designs the systems uses them or even is who an actually use.

All the technologies needed to access the same set of content through different media are available openly, in other words, without direct costs of acquisition associated. And it facilitates the exchange of contents (SCORM – Sharable Content Object Reference Model) (Roth, 2013, p. 8, p. 53). The various types of possible connections, made by cell phones, tablets and desktops directly or through immersive virtual environments (or not), provide a variety of options. But, despite the many plug-ins, many environments were not made to the current needs of new generations, not to mention that the mobile world dictates the desktop trends.

The trend to bring your own technology (BYOT) – bring your own device (BYOD), bring your own phone (BYOP) and bring your own PC (BYOPC) – refers to the policy of permitting employees to bring personally owned mobile devices (smartphones, tablets and notebooks) to their workplace, and to use those devices to access privileged company information and applications (Bradley, 2011), http://en.wikipedia.org/wiki/Bring_your_own_device). The term is also used to describe the same practice applied to students using personally owned devices in education settings (Lee, 2012). In this sense, BYOT is an educational development and a supplementary university technology resourcing model where the home and the university collaborate in arranging for the young's 24/7/365 use their own digital technologies to be extended into the classroom to assist their teaching and learning and the organisation of their schooling and where relevant the complementary education outside the classroom. Gartner (2012) said that BYOD is the most radical shift in enterprise client computing since the introduction of the PC. This wave, disruptive technologies and advancement in technical infrastructure and in learning technology, opens for new ways of teaching in the classroom. Probably, the main benefits from BYOD at universities can be at removing costs and efforts to acquire, administrate and maintain own laboratories, as well providing interactive classroom tools that provide better user experiences.

In 2014 consumption of media from smartphones will overtake consumption via PC's (eMarketer). Another study (Pew Research Center) reports that 74% of teens use the Web from smartphones. More than half of young people only use this type of cell phone to consume content. And 89% of those contents are consumed via Apps (Smart Insights). That is, in only 11% of the cases the browser is the chosen channel to access content (Oliveira, 2014, p. 6), (http://www.emarketer.com/), (http://www.pewresearch.org/), (http://www.smartinsights.com/). Universities are adapted to this type of demand? At least a Responsive Web Design (RWD) on their websites?

In August 2009, a different design of environments like Schoology emerged, based on the philosophy of social networks and instant messaging support. No exceptional disruption was perceived and five years have passed since then (until 2014) that in information technology represents a universe of possibilities (https://www.schoology.com/), (http://en.wikipedia.org/wiki/Schoology). However it is a proprietary system (paid software) which inhibits many universities that do not realize or even visualize some justification for its acquisition. The reverse logic probably refers to the observation that, if there is no motivation or incentives (by institutions) to (professors) use the resources of open systems available, why pay for a system that probably will not be used too often?

The same can be said of immersive 3D environments like Second Life (http://secondlife.com/), (http://en.wikipedia.org/wiki/Second_Life). This virtual environment was a fad in the biennium 2006-2007. Remains active, without the spotlight of the specialized media, but most users (residents) left Second Life, migrating to social networks like Facebook (not necessarily back to “real life”, but usually returning to “real identity”). The system of Linden Lab never found the right concept to be used for education. Many companies and universities from the real world have invested in virtual islands just to have a presence in this new world. Are these pretentiously modern trying to score land even without knowing what to do with it. Something like trying to be present not to be forgotten, extinct or even swallowed by the revolution – that

never happened.

When users have different identities and often seek this environment as an escape from their normal lives – as if it was possible another life – what is the relationship with real life (where are the physical companies and universities)? None. However the testing and experimentation are always valid. We cannot criticize what we don't know. An open source option is the OpenSimulator (OpenSim), a less restricted version and financially free of Second Life's architecture (http://opensimulator.org/), (http://en.wikipedia.org/wiki/OpenSimulator), (http://opensimulator.org/wiki/Main_Page), (http://elearning.unica.it/opensim/).

Environments such as Moodle (considered the most popular by Capterra) are installed to exhaustion mainly because they are free (without direct costs of acquisition – because there are always maintenance costs), has a considerable user base (many congeners) and are more than enough for the few uses that most faculty confers, practice or even demonstrates need. Moodle is a project with more than ten years of life. Technologically speaking this is relevant and cannot be ignored. The concept, created in 2001 by Martin Dougiamas, turned into 20/08/2002 in its first version (Moodle 1.0) which featured 10 releases (1.0 to 1.9) and several intermediate versions (up to 1.9.19). The second version (Moodle 2.0) already had 8 releases (2.0 to 2.7), and the current version is 2.7 (12/05/2014). All versions prior to 2.3.11 were discontinued, but that does not mean they are out of use, but only that the support is no longer provided. The version of Moodle more used worldwide is the 1.9.x (without current support). That is, more than 50% of all installations have not evolved to version 2 (and we are already on the eve of version 3). A quick analysis reveals that Moodle did not evolve much. Even the said support has become unnecessary for most users. Although both the official website as the references found emphasize that the system evolves constantly adapting to the needs of its users, in fact it appears that the design of Moodle remains the same, centred in disciplines and forums. Besides the system does not properly meet the current needs of the students it turns out that the vast majority of the facilities are not even updated, since most professors even explore the basic features available since the first version do not produce content.

Probably the wrong question is something like: Why update if is working properly? Actually nothing is working well nor from the side of the Moodle developers much less in the universities side. The project of the LMS, in a way, stopped in time and the use of it is minimalist. The vast majority of institutions (which not even update installed versions) keep it in use because besides not import in direct costs of acquisition is a way they demonstrate that are technologically active and engaged – although it is just another misuse technologies.

This program is freely available as open source (GNU Public License) and can be installed in any operating system (Windows, Linux, Mac) that can run the PHP language. As the database can be used MySQL, PostgreSQL, Oracle, Access, Interbase or any other accessible via ODBC (https://moodle.org/), (http://en.wikipedia.org/wiki/Moodle).

The Moodle website has some statistics that can not be interpreted without context (like everything in life). On 17/05/2014 would be 64,630 registered websites. This does not mean that they are active websites, much less that they are updated (https://moodle.org/stats/). This environment is being used in 235 countries and the ten largest users are United States (11015), Spain (5478), Brazil (4329), United Kingdom (3667), Mexico (2664), Germany (2368), Colombia (1754), Italy (1704), Portugal (1593) and Australia (1513).

The critique here is not about Moodle (or any other conventional environment). It fulfils reasonably well the function for which it was designed (in 2002). The problem are the users (professors) that don't use all their resources or even use the environment incorrectly, in most occasions only as a file repository – the same materials that were intended for xerographic copies. But, despite several updates and several plug-ins developed and available, the system often seems a patchwork. An analysis of the Moodle source code shows different types of modelling without a default, redundant codes, low performance and errors that persist even with new versions. The migration process from a previous version to a newer can be a

challenge and generate many problems – which ends up discouraging many universities to update what is working.

In addition to not adapt to current needs correctly the system is still student-centred. The paradigm of the distance education ended up influencing classroom learning and teaching-learning process before professor-centred evolved initially for the student and then to communities, coexistence networks established by the relationship between professor-student(s) and between students (Roth, 2011, p. 7). Of course there are many variables to be worked that prevent or hinder the development of these initiatives. The arguments most often cited are lack of time and skills of professors; along with the absence of a system of recognition or curricular reward. In addition, the lack of interest in pedagogical innovation is also a significant barrier. But it is likely that, when universities are filled with animators of collective intelligence aware of the relevance of guiding, observe and record the development of their students, they will be called simply “professors”. After all, the professor's role always been helping students to learn (Roth, 2011, p. 43).

Any proposal, technology or new methodology on the horizon? If were alive Carl Sagan would probably say yes. “Somewhere, something incredible is waiting to be known.” (Gelman et al., 1977, p. 53). A hasty reflection trying to analyze where we came from and where we are going – related to education – does not provide the answers since the problem has never been technological. We do not need to develop something new to make the educational practices more interesting. There are many environments and platforms available and innovation does not necessarily involve the invention or development of something completely new, but through the use of what already exists, often free of charge. It can be a rereading of old ideas, a recombination or new approach about something that already exists, or simply an imitation of something that exists elsewhere. A creative idea does not need to revolutionize the world, be totally unique, radical, extravagant or even fun, but it has to be something socially useful and that solves a real problem (Carvalho, 2012).

In 1995 Steve Jobs quoted a phrase attributed by him to Pablo Picasso: “Good artists copy. Great artists steal.” and added: “We have always been shameless about stealing great ideas.” (Denning, 2011), (http://www.youtube.com/watch?v=TRZAJY23xio). Ethics aside, what can be seen as lesson is that not necessarily developing an original solution can lead to success. More important than this would be to use effectively than there is already available, often without costs of acquisition, although developed by others (such as Moodle, for example).

The Ca' Foscari University of Venice (UNIVE) following the minimalist trend of use, practiced by their European counterparts, offers Moodle in several instances. The main is hosted in http://moodle.unive.it/. The Department of Environmental Sciences, Informatics and Statistics (DAIS) ever experienced local facilities of restricted use, including a specific version for external courses and certifications (http://moodle.dsi.unive.it/), (https://moodlecertif.dsi.unive.it/). The study of languages seems to be the area of Ca' Foscari that gives more attention to the environments, with the production of small content and many tests (Quiz). This activity module allows the professor to design and build tests with a variety of question types, including multiple choice, true or false and short answers. Moodle keeps these questions in a question bank allowing the recycling (reuse later). It is an exception perceived also at DAIS and not the rule in established practices. However, this type of test that Moodle provides and that the University Language Centre (CLA) and DAIS use are more related to the memorization and simple answers than the problem-solving (http://claonline.unive.it/), (http://cladidattica.unive.it/).

Someone could argue that problem solving does not apply to certain areas such as teaching languages or computer science. On the contrary. A parrot can also memorize not only words, but whole sentences and repetitive logic without knowing what to do with them later or even when the conditions of temperature and pressure are not exactly the same previously verified.

My latest experiences (as a student) related to learning foreign languages (Ukrainian and

Italian) were disappointing. In both cases the teachers had a good command of the language. But seemed to be more prepared to improve students' language dominance than teach from scratch. And no one can improve what has not as a basis. These were conventional courses, based on books and with a lot of homework. Nowadays (pedagogically sound approach) nobody else uses the homework as teaching resource. In Germany, for example, children leave their books at school. Fontein (2012) stated that “No child would be having their free time dominated by doing school work.” No child, and certainly, no adolescent or adult. This trend fortunately starts being followed in other countries, such as France and Australia (Matthews, 2012), (Walker and Horsley, 2012). But the teaching languages persists in this old approach (to transfer home what should have been done in the classroom) what will consume classroom time to correct the lessons later. The lack of conversation practice, lack of classroom support and (at last experience), and the replacement of hours of presence classes by exercises over the internet is a misuse of that technology, a fake presence and modernism in reverse.

Other facilities related to the teaching of languages in Ca' Foscari are found at the Linguistic Laboratory (that serves two departments) and the Center for Language Teaching, Department of Linguistics and Comparative Cultural Studies (http://lingue.cmm.unive.it/), (http://venus.unive.it/italslab/). It gives the impression that Ca' Foscari has several redundant areas, which overlap and even find themselves in internal competition. None of them establishes a market differential, new methodologies or even the correct use of technologies.

3. Video and Video Conferences

A picture is worth a thousand words? Fernandes (2009) mocks the phrase attributed to Confucius: “A picture is worth a thousand words. Try saying it with a picture.” Some situations are impossible to be properly represented or identified only with an image. On the other hand a text allows various interpretations according to the reader's imagination. But this bipolarity doesn't apply to a video or even to videoconferencing. After all when we join several images in sequence (make a video) with words we will always be the best of both worlds.

Even in the CLA where we found some content production and exercises to assist the teaching of languages, the most that we found were audio files. Activities performed mainly at a distance or even in person -synchronously or asynchronously – found in videos and in videoconferences an indispensable support to its effective understanding. It is a way to meet people (not through a static photo or even some text that can be authored by others) and is connected directly to the safety of traditional evaluations made at distance.

The case of teaching and study of languages is important, since without this support if they lose the facial expressions and, in the specific case of the Italian language, the use of hand gestures – so characteristic and so significant. Remove or tie the hands of an Italian and a large part of its power of communication is lost. It is not the essence of communication, but certainly a necessary environment to emphasize the statements. The practice is cultural and so entrenched which can be observed during the use of cell phones (including hands-free kits) without the video is being used or even another person be present.

The widespread increase of available bandwidth in the various types of internet connection and the ubiquity of video cameras on all smartphones and tablets only collaborate to increase the gap between the reality (market and users) and the practice of universities. Social networks have moved towards this new model, introducing video plug-ins. What was previously limited to specific applications (Live Messenger, Skype, etc.), became common place to meet the demand. The same happened with the creation of plug-ins for the various LMS, unfortunately without the same attention and/or use.

Even with the quality of the new specialized systems of videoconferencing like telepresence what we have seen is an occasional use (normally limited to scientific events) and not in educational practices.

4. In-person environments

Some authors such as Tapscott (2009) believe that universities will collapse if they don't follow the techno-social and cultural changes that are inevitable. Others like Wyatt (2001) had imagined that the use of technologies (Web-based learning) would be the beginning of the end. But they were wrong. Over the centuries since the founding of the first institution in the Western world, the university has faced many challenges and demonstrated a remarkable adaptability and resilience (Santos, 2002). However with the evolution of socio-economic contexts increasingly knowledge-based, these institutions have been subject to unprecedented pressures and challenges.

Faced with a reality where computing tends to become increasingly pervasive, many people believe it is the end of the use of paper and consequently the end of printed books – now that digital books are increasingly ubiquitous and available. The tablets and smartphones are around. How long it will survive?

Offering distance courses in integral scheme of e-learning or even blended is no longer enough to become a reference or even excel in an EHEA, which pasteurized offers, standardized content (making equal different courses), stimulated the mobility and where a same paid course coexists with an identical free of charge. In times where all universities may appear to be (on the internet) what they see fit (crap marketing scheme), where the offerings of courses through e-learning multiply exponentially how to stand out in chaos? What is the perfect connection to do not get into the banality of similar offerings? The answer, to Roth (2013), comes from own question and applies to any endeavour, including educational, that want to highlight and/or start a new cycle of life: innovate, find a right concept, and establish a market differential.

This search is not limited to virtual environments but must be extended to the in-person environments, local. If we do not have good physical environments for production, support, teaching and study, everything that we offer at distance will be just false advertising.

Ca' Foscari developed the CFZ Zattere (Cultural Flow Zone), (http://www.unive.it/nqcontent.cfm?a_id=161749). Conceptually the model is innovative. It is a cultural centre, an open, comfortable, polyvalent space, dedicated to encounter and exchange between students. In CFZ is possible to find services and training courses, extracurricular activities that complement the studies, projects designed and realized by students and spaces for relaxing, reading, studying and consulting books.

New spaces of coexistence is a trend also found in Portugal. Diogo Moreira, SAS manager of the Polytechnic Institute of Viana do Castelo (IPVC) explains that: “We have come to the conclusion that the model of canteens and bars was inadequate to the needs of students today and decided to radically change the concept of food services, going to be centred on the importance of providing an experience to student that goes beyond own meal.” This Portuguese institution is ending with the traditional spaces of the refectories, converting them into social areas where also you can eat and which will be accessible to students at any time of day (Silva, 2014).

5. Role models

Sartoretto (2014) said: “Did you thought about improvements to my Course in Moodle?” “Calcolo Mod 1 e Mod 2 [CT0309] – Prof. Sartoretto”, (http://moodle.unive.it/).

Probably the question was a little more complex than this. Without any motivation or benefit, how to make disciplines such as the calculation become more attractive and interesting for

students of informatics who often do not realize or even don't care about connections between the means and the ends? I think it begins by changing professor's posture which includes stop giving conventional classes (traditional). Look the syllabus with other eyes (through the clients' eyes) and establish a contract with students. Identify real connections between contents, subjects, course and student needs (put yourself in their place), building bridges. Not be limited to the theories and exercises that are unrelated to any problem or real situation. This means find and/or develop examples and practical situations where the content to be developed are really important, essential. Which can be visualized with the use of images, photos and videos and not just numbers and words (like this text). Without this connection is only distant theory, tedious even boring. And the feedback will be the lack of interest and participation because personal goals will only win the discipline and move on giving attention to what really matters (as if the Calculus and logic did not matter).

But how to be innovative and overcome what is outdated? How to get rid of old formulas and make room for the unexpected? Starting to make room for the unlikely (but not impossible). In addition to the logical levels 0 and 1, a digital circuit can still present a third state (tri-state). It's called the state of high impedance, where the output does not contribute to the high level, or to the low level. The classical bit (digital) can have the value of zero or one. Already the quantum bit can simultaneously load two values (http://en.wikipedia.org/wiki/Three-state_logic), (http://en.wikipedia.org/wiki/Qubit).

The Lifehacker reminds us. Are you asking the right questions? (Drager, 2011). The Fast Company brings several suggestions on how to do this (Berger, 2011). “Where do I start?” could be a good option. When we deconstruct stories of innovations we found the source of the success of companies that offer products and services before unthought always converging in a simple question that is often considered a bit provocative, naive or even a little insane: “What if?”. Williams (2011) of Frog Design talks about how this strange and unusual question was the impetus for the launch of Little Miss Matched, a company which proposes the use of socks that don't match on purpose. One among many examples cited as new and innovative business that began with what he calls “a disruptive hypothesis” (a hypothesis which tends to disorder) (http://www.frogdesign.com/), (http://www.littlemissmatched.com/). Suggests five steps to identify disruptive opportunities: 1: craft a disruptive hypothesis: be wrong at the start to be right at the end; 2: define a disruptive market opportunity: look where no one else is looking; 3: generate several disruptive ideas: make the ordinary unexpected; 4: shape them into a single, disruptive solution: avoid novelty for novelty's sake; 5: make a disruptive pitch that will persuade internal or external stakeholders to invest or adopt what you've created: under prepare the obvious, over prepare the unusual.

Another pioneer is Netflix, whose business model answered the question: “What if a video rental company didn't charge late fees?” (https://www.netflix.com/). The large number of technological innovations most sought on the internet was born from an attempt to answer ambitious questions like “What if we could somehow crowdsource everything a city has to offer?” (principle of social network Foursquare) or “What if we could get any question immediately answered by the world's smartest people in the world?” (like Quora). (https://foursquare.com/), (http://www.quora.com/), (http://en.wikipedia.org/wiki/Crowdsourcing).

It's not bad discover that we don't have all the answers. Just start asking the right questions. Progress often comes from those who dare to question: “What if?” Complete this question the right way is a great shortcut to ask the right question. After all, it's not just a matter of being willing to question; It is necessary to know how to question.

What still prevents the Italian university to surrender to technology is the resilient veiled practice of magister dixit (argument referring to an authority regarded as unquestionable), for whom the opinion of a master (professor) did not allow replica. The term was used by professors in Florence and throughout Italy around the year 1600, to impose silence students who questioned the theories of Aristotle, considered the master of astronomy. When a student

at the university questioned some theory of Aristotle, professors soon interrupted saying “magister dixit”, which means “the master said – it is not discussed” and could end the matter.

De Morgan's law was pointed to by Sartoretto (2014) as a problematic topic to be transformed into attractive to undergraduate students (http://en.wikipedia.org/wiki/De_Morgan's_laws). These theorems are proposed to simplify expressions in Boolean algebra. Define rules used to convert logical operations OR in AND; and vice versa.

Several videos have been produced on the subject. For example, those of William Spaniel: Logic 101 (#19): DeMorgan's Law, Part 1 (http://www.youtube.com/watch?v=xu6kE6Meyb0). Logic 101 (#20): DeMorgan's Law, Part 2 (http://www.youtube.com/watch?v=6NEAEeDoqNQ).

Teaching materials also exist ready, to exhaustion. For example, some distributed as OCW by Massachusetts Institute of Technology (MIT): Probability and Random Variables – by Scott Sheffield, MIT (Course Number 18.440) (http://ocw.mit.edu/courses/mathematics/18-440-probability-and-random-variables-spring-2011/).

More recently and already shaped as course, some MOOCs as provided by different providers like Coursera. Making Better Group Decisions: Voting, Judgement Aggregation and Fair Division by Eric Pacuit, University of Maryland (https://www.coursera.org/#course/votingfairdiv).

The use of formal logic in law courses is suggested by Lawsky (2010) which presents a practical problem using De Morgan's law. And Volokh (2008) discusses how a Supreme Court case (USA) seems to conflict with De Morgan's law.

There is no subject that cannot be turned into a practical problem, making connections between theory and everyday situations that allow a better understanding. And the same technology that allows mass the sharing of these contents allows generating individual versions of the same question. Facing a certain problem (proposed by professor) students may have different interpretations and choose different paths to find their solutions.
Even the highest mountain has many faces to be climbing. The important thing is to get to the top, no matter which way. But while the internet offers a plethora of information (many do not correct or even trusted) rests with the professor guiding this crossing avoiding certain roads or even driving students to the desired direction.

When the internet became graphical began exploring a system of hypermedia documents interlinked and executed, known as the World Wide Web, Web or WWW. These terms translates as a worldwide web while the internet nowadays is much closer to the concept of a huge unorganized forest (which has everything and anything can happen, including getting lost) than an organized and limited spider web.

It is not practical these days to waste time copying theory on a blackboard, dictate lessons to students, make photocopies, make pdf files for download or even read in a textbook. All these information are available through various formats (text, image, video), courseware (OCW) courses (MOOCs), blogs and websites.

Since 2004 students in the Woods College of Advancing Studies at Boston College have the opportunity to participate in the development of a new form of distance learning that combines interactive virtual reality with collaborative online course environments and classrooms (http://www.bc.edu/schools/advstudies/), (http://mediagrid.org/publications/presentations/Immersive_Education.pdf). These experiments led to a series of events, starting by Enabling the Age of Immersive Education (Boston, 2005), the creation of the Immersive Education Initiative in the same year and the sequence of events iED since 2007 (http://www.immersiveeducation.org/). These events, like the current edition (IMMERSION 2014) address the personal and cultural impact of digital technologies such as wearable computing, virtual reality (VR), augmented reality (AR), mixed reality (MXR), neural

interfaces, affective computing, neuro-gaming, telepresence, virtual worlds, simulations, learning and training systems based on games, immersive MOOCs and totally immersive environments, like caves and domes (http://summit.immersiveeducation.org/).

They are new and not so new concepts that could generate new products to move the industry and thus moving the world. Although several universities are present realizes that the real players are sized companies focused on games (is what moves this technology) and greater computing power necessary. Back up that way to the recurrent insistence of carry the world of gaming for education (learn by playing) – coherent strategy while held as a further means, even not to thwart the new clients, created in this reality.

Most often these are distant technologies of university reality – I speak here of public universities in countries where the donation of resources is not common practice and available resources always seem insufficient to the needs. These universities that, in front of a set of uncertainties as to its own maintenance avoid to invest or even support certain fads and are limited the free options, how to install an LMS, a digital repository (as ARCA) and maintain a website often without dedicate versions in other languages that meet the needs of its external clients (http://arca.unive.it/), (http://www.unive.it/).

Total immersion environments as the caves and domes are fantastic and with almost unlimited possibilities of use: Avango, CATIA, Cave5D, CAVELib, CaveUT, CoVE, EON Icube, Equalizer, inVRs, libGlass, Mechdyne's Conduit, P3D VirtualSight, Pro/E, Quazar3D Immersive, Quest3D, Syzygy, TechViz XL, Unigraphics, Vis5D, Vizard, VR Juggler, VR4MAX, Vrui (http://en.wikipedia.org/wiki/Cave_automatic_virtual_environment). But specifically with respect to education, what do we do when we finally have access to the Holodeck (the most perfect of immersive systems, able to reproduce perfectly the real life with people and environments)? (Bilton, 2014), (Moursund, 2014), (http://en.wikipedia.org/wiki/Holodeck). We will start a third life – because the second (Second Life) did not materialize? Or simply continue to reproduce the old techniques and approaches that, unfortunately, are still in use?

Some of the most important technologies are those that become part of the environment. Weiser (1991) considered the father of ubiquitous computing (omnipresent) wrote that “The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.”

Nowadays we can transform the house of Flintstones on home of the Jetsons. But unfortunately the children of both continue to attend the university of the first. Many professors are still trying to teach as they did in the 20th century, or worse, 19th. It is a cultural atavism. Many of them are digital immigrants compared to students who have already been created in this virtual world (Roth, 2013). We will continue to teach through immersive systems or we will recover what has been lost, do a rereading of good practices and really provide students an innovative experience (not just technologically speaking)? If we are not able to make an interesting classroom experience, what makes us think that a virtual environment can do (by itself) more quality into the process? O even we'll desist to manage processes and lead our students to their own discoveries, keeping the focus (no dispersions), controlling the excess personal exposure and avoiding procrastination?

With the growing popularity of social networks and personal blogs, the potentially dangerous practice of oversharing became commonplace. Oversharing is the act of sharing too much personal information with people who are not necessarily prepared and qualified for it. Different people may have different ideas about what constitutes oversharing, so they may not realize they're making others feel uncomfortable. The oversharing could be considered an addiction of the new generations? When we have more means in our hands, we need to expose more information and feelings? What is the best way to prevent or remedy the problem? The fundamental lesson is invariably the same rule for all social networks: never forget that the whole world is watching.

There's too much information and knowledge of less in the use of the Internet in education. There are lots of data, lots of information available, not always reliable. In the information, data are organized into a logical, code or structure determined. To know is to integrate the information in our benchmark, appropriating it, making it significant for us. Knowledge does not transfer, knowledge is created, is built every day. Many students scatter in the tangle of possibilities and do not seek what they should, leaving drag to areas of personal interest. It's easy to waste time with information little meaningful, staying on the outskirts of subjects, without deepen them, without integrating them consistently. The process of knowledge happens when filtering, select, compare, evaluate, synthesize, contextualize what is most relevant and meaningful.

Our students become more ignorant, find ready answers, pasteurized texts and perform many copies authored by others. The ethical side of search, adapt and then create and adopt is being replaced by the simple act of adopting ready answers that don't fit exactly to all new challenges. Conversely, the Internet mirrors the real wishes of every one of us, desire to be out of control of states or even of other institutions, which through other media are always “guiding us”, offering the “best” economic and cultural products.

For those who are procrastinating (deferring an action), this results in stress, feelings of guilt, loss of productivity and shame in relation to the other, for not fulfilling their responsibilities and commitments. Procrastination can be considered normal, but it becomes a problem when it prevents the normal functioning of the actions. People are losing focus and the internet is becoming just a place for fun and to pass (occupy) the time, mostly with things that don't add absolutely nothing and still exposes too much. That is, has nothing to do with education and with everything good that you could obtain from technologies when used correctly.

If we don't even utilize the potential of what we have at our disposal (I speak about what has come to stay and not temporary fads) how to think only in evolve technologically (such as hardware and software) without remembering and meet the requirements to make this practice effective and correct? Current needs are no longer focused on the accumulation of knowledge. The focus should be the ability to solve problems. Given this context of variables and uncertainties, professors need to do their part (lifelong learning is a concept that should be applied to everyone and not just for others) seeking the update (didactic and technological) and a way to explore their creativity and willingness to innovate (if these exist even in latent form). In this sense, must act autonomously, seeking new viewpoints, new solutions and try to do something different from the usual. You do not get different results doing the same things and the same way.

The Web 2.0 may have facilitated many things as the creation of search engines (Google, Bing, Yahoo, etc.), the collaborative websites (Wikipedia, YouTube, Twitter, etc.) and social networks (Facebook, Google+, LinkedIn, etc.). But nothing prevented the authorship in the Web 1.0 or even earlier when the internet was not graphic or when it did not exist.

Not everything is available on the internet and never will be. Books and publications of quality usually are printed and sold or have access to controlled content – and not offered for free or even possible to be localized by any search engine like Google. Just a quick comparison between centuries of resistance that has printed books and how fragile are the eBooks that are in the cloud. A single data communication failure, power supply failure, server failure – or, why not remember an atomic blast – so that everything gets lost or becomes inaccessible.

Will be the Web 3.0 (semantic) which will give the solutions? Or the Web 4.0, Web 5.0? What is the limit to induce in the people concepts that don't exist and that can become reality (or not) and are geared more to the infrastructure (systems, websites and databases) than end-user usability?

The difference between being the author, copier or just reader not settles by technology, but by an educational issue, moral, personal. The art of writing involves practice and also reading. We

can provide a technological environment (add a framework) to these matters but will always be a means and not an end.

Is it possible to make education in the 21st century without the use of the latest technologies? Of course it is possible. It would also be possible to write this text by hand or using outdated technologies as a typewriter (manual, electric or electronic) or even some PC of the first generations. The fact that we use the latest media does not imply necessarily in best quality. But responds to the expectations of other stakeholders, that is, of who is on the other side. And this reduces frustration.

My best texts do not appear on the screen of a computer (or any other contemporary device) but of a sheet of paper and a pen when I wake up at night or even dispersed during the day, not concentrate on what I have to do. The technology allows me to work these texts, fix them, appropriate form and content. But the original ideas never come this time.

The musician Nei Lisboa expressed this technological disenchantment. “The email is phone without embarrassment, fax no busy signal, answering machine without babbling to the void. But I wonder if I'm not missing received a long letter, with those pages of custom calligraphy, well sealed, chubby and warm waiting for me in a real mailbox. We are getting wonderfully unhappy.” (Castro, 2006).

Similarly will not be the technologies (outdated, current or even future) that will by itself – and magically – give a better quality to the educational activities and rectify contemporary practices. Everything goes through experimentation, adaptation, training, testing and finally production. After identifying which technologies fit best on the reality of the university and students, take ownership of the same (master their use) and surprise people with innovative proposals. There is also the need to venture out of the commonplace and get something uncommon, unusual, carrying the practices beyond the small horizons.

Buzell (1989) quotes the statement of Otto von Bismarck: “You are all idiots to believe that you can learn something from your experience, I prefer to learn from the mistakes of others to avoid my own mistakes.” We learn more from our mistakes than from our successes and no success story can be replicated like a cake recipe. There is no magic formula, turnkey solutions or models to be followed and repeated. Homework of the type do as I say and not as I do, I have to do, or even am forced to do; are empty when we presume to teach, demonstrate, or even suggest something that we never practiced in our personal journey.

We do not live in a world of absolute truths, but always transient. A few years ago the smallest perceived particle as existing in the universe was the atom. And where are we today? (Higgs boson). Where we'll be tomorrow? And in the coming years?

In Denmark, since 2011 students can do their exams connected to the internet using all sources of information available to develop an original work, namely, to give answers to a demand, to solve a particular situation that simulates their needs in current real world. (Cisco Systems, 2011). It's more a resource, just like in real life (creative chaos). Many people associate the word chaos to disorder or something negative, but is inappropriate, because even scientifically the creation came from chaos (all possibilities).

The same technology that massified in virtual form the university (previously massified presentially) can provide the answers and indicate a way back to the quality. But for that to happen, the universities need to turn their eyes to the essential (the training of students, technologically updated and correct, including pedagogically) and abdicate a bit of pseudo-marketing represented by university rankings. The new generations are less manipulated and don't usually consult rankings (always biased in some way), after all, the information provided has been previously interpreted. Who judges, opines or evaluates never does impartially, but according to his life bias, which includes their prejudices as well as the commitment to the current situation.

Nowadays social networks echo like no other medium the “longings seasoned with fears, paranoia and other questions” (Nada Além, Los Porongas), (http://www.losporongas.com.br/). To the extent that many European universities engaged in search of modernity and the students have a wide range of mobility, this can change the options of where perform the training – with greater or lesser technological integration, even as these customers well or poorly serviced share their reviews on the internet producing, depending on the case, or a free positive marketing or a destructor negative marketing.

Many potential students (domestic and international) of Ca' Foscari end up opting to study Informatics at Padova – than in Venice. It would not be the time to create a highly competitive market advantage? A real appeal and irresistible which reversed this demand in a sustainable way?

The alternative to the current model can be in a step back to the past (one step back in order to take two steps forward), not ignoring the technologies (that came to stay), but performing a rereading of good teaching practices (including medieval as the Socratic method), establishing connections and adapting them to needs and local realities.

References

Aunión, J. A. (2011). Los profesores con más experiencia podrán ejercer hasta los 75 años – Campus que envejecen. El País, Sep 14. Retrieved Jun 4, 2014, from http://elpais.com/diario/2011/09/14/sociedad/1315951203_850215.html#despiece1

Benino, A. (2009). Notes on the Anomalous Wave, the G8 of Universities, the Repression and What (Presumably) Awaits Us. European Institute for Progressive Cultural Policies. August. ISSN 1811-1696. Retrieved Jun 9, 2014, from http://eipcp.net/transversal/0809/benino/en

Berger, W (2011). Big Innovations Question the Status Quo. How Do You Ask the Right Questions? Fast Company, March 17. Retrieved Jun 6, 2014, from http://www.fastcodesign.com/1663429/big-innovations-question-the-status-quo-how-do-you-ask-the-right-questions

Bilton, N. (2014). The Holodeck begins to take shape. The New York Times, Jan 27, page B5. Retrieved May 29, 2014, from http://bits.blogs.nytimes.com/2014/01/26/disruptions-the-holodeck-begins-to-take-shape/.

Bradley, T. (2011). Pros and Cons of Bringing Your Own Device to Work. PCWorld. Dec 20. Retrieved Jun 12, 2014, from http://www.pcworld.com/article/246760/pros_and_cons_of_byod_bring_your_own_device_.html

Buzell, R. D. (1989). Das PIMS-Programm – Strategien und Unternehmenserfolg. Wiesbaden: Gabler. 256 p. ISBN 3-409-13343-7.

Carvalho, P. (2012). Sete ideias da Campus Party que podem transformar a economia. Retrieved Feb 9, 2012, from http://economia.ig.com.br/sete-ideias-da-campus-party-que-podem-transformar-a-economia/n1597619592076.html

Castro, F. (2006). Navegadores na Escola: Identidade Cultural em Tempos de Internetês. Canoas: ULBRA, 103 p. Retrieved Jun 1, 2014, from http://www.bdae.org.br/dspace/bitstream/123456789/2219/1/tese.pdf

Cisco Systems (2011). Danish National Assessment System: A case study. Retrieved Jun 14, 2014, from http://www.cisco.com/web/strategy/docs/education/DanishNationalAssessmentSystem.pdf

Costa, J. V. (2004). A reforma do ensino superior ditada pela sociedade do conhecimento. Retrieved May 28, 2014, from http://ae.tagus.ist.utl.pt/doc_nac/cbs/201.pdf.

Demo, P. (2002). Desafios modernos da educação. 11ª ed. Petrópolis: Vozes. 272 p. ISBN: 8-53260-977-5.

Demo, P. (2012). Contos-do-Vigário. Rio de Janeiro: DP&A. Retrieved May 18, 2014, from

http://hipocrisiaacademica.blogspot.it/2012/05/educadores-contos-do-vigario.html

Denning, S. (2011). The Lost Interview: Steve Jobs Tells Us What Really Matters. Forbes, November, 17. Retrieved Jun 14, 2014, from http://www.forbes.com/sites/stevedenning/2011/11/17/the-lost-interview-steve-jobs-tells-us-what-really-matters/

Drager, D. (2011). How To Innovate By Asking The Right Questions. Lifehacker, March 3. Retrieved Jun 6, 2014, from http://lifehacker.com/5783600/how-to-innovate-by-asking-the-right-questions

Evans, R. (2001). The human side of school change: Reform, resistance, and the real-life problems of innovation. 1ª ed. San Francisco: Jossey-Bass. 336 p. ISBN 0-78795-611-2.

Fernandes, M. (2009). A emocionante disputa palavra X imagem. Revista VEJA, Edição 2114. Retrieved May 25, 2014, from http://veja.abril.com.br/270509/millor.shtml

Fontein, B. (2012). German high school bans homework. UPI, October 7. Retrieved Jun 14, 2014, from http://www.upi.com/Odd_News/2012/10/07/German-high-school-bans-homework/UPI-52871349619728/

Frías-Navarro, D., Pascual Llobell, J., Monterde i Bort, J., Pascual Soler, M., Badenes, Ribera, L. y Pascual Mengual, J. (2010). Impacto del OpenCourseWare (OCW) en los docentes universitarios. Valencia: UV. 35 p. Retrieved April 26, 2014, from http://www.uv.es/impacocw/impactoOCWValencia.pdf

Gartner, Inc. (2012). Gartner Says Bring Your Own Device Programs Herald the Most Radical Shift in Enterprise Client Computing Since the Introduction of the PC. Stamford: Gartner. Press Release. August 28. Retrieved Jun 12, 2014, from http://www.gartner.com/newsroom/id/2136615

Gelman, D., Begley, S., Gram, D., Clark, E. (1977). Seeking Other Worlds. Newsweek, August 15, pp. 46-53.

Hazelkorn, E. (2011). Rankings and the reshaping of higher education: The battle for world-class excellence. New York: Palgrave MacMillan. 240 p. ISBN 978-0230243248.

Lawsky, S. (2010). Formal Logic in Law School? Retrieved Jun 3, 2014, from http://www.theconglomerate.org/2010/03/formal-logic-in-law-school.html

Lee, M. (2012). BYOT. February 5. Retrieved Jun 12, 2014, from http://malleehome.com/?p=184

Matthews, D. (2012). François Hollande wants to abolish homework. Is that a good idea? The Washington Post, October 17. Retrieved Jun 14, 2014, from http://www.washingtonpost.com/blogs/wonkblog/wp/2012/10/17/francois-hollande-wants-to-abolish-homework-is-that-a-good-idea/

Moran, J. M. (2003). Educação inovadora presencial e a distância. São Paulo: USP. Retrieved June 11, 2014, from http://www.eca.usp.br/prof/moran/site/textos/tecnologias_eduacacao/inov.pdf

Moursund, D. (2014). Progress in Creating Star Trek's Holodeck. Information Age Education, Feb 18. Retrieved May 29, 2014, from http://www.i-a-e.org/iae-blog/entry/progress-in-creating-star-trek-s-holodeck.html

Oliveira, P. M. (2014). A permanente mutação da Web. Revista Exame Informática. n. 288.

Roth, R. (2004). Potential and Limitations of Web-based Distance Education Environments that use Audiovisual Communication Systems Delivered via Broadband Networks. Palma de Mallorca: UIB. 252 p.

Roth, R. (2007). The Applicability of Desktop Videoconferencing Systems over Broadband Networks to Support the b-learning Education System. Aveiro: UA. 61 p. Retrieved April 26, 2014, from http://hdl.handle.net/10773/11350

Roth, R. (2011). The Demonstration Effect for the Creation of Learning and Conversation Networks within the Realm of Creative Chaos. Lisboa: UTL. 130 p. Retrieved May 7, 2014, from http://hdl.handle.net/10400.5/5920

Roth, R. (2013). Implementation Strategies and Development of an Open and Distance Education System for the University of the Azores. Ponta Delgada: UAC. 162 p. Retrieved

May 7, 2014, from http://hdl.handle.net/10400.3/2327

Sá, R. (2004). Recursos digitais no ensino das Ciências Naturais. Porto: UP. 191 p. Retrieved April 26, 2014, from http://hdl.handle.net/10216/64053

Salmi, J. (2009). The Challenge of Establishing World-Class Universities. The World Bank. 136 p. Retrieved May 18, 2014, from http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079956815/547670-1237305262556/WCU.pdf

Santos, S. M. (2002). Universidade do Minho: Missão a revisitar? Forum 31, Jan-Jun, 29-62. Conselho Cultural da Universidade do Minho.

Sartoretto, F. (2014). Internet publication [personal communication]. Message received from <sartoret@unive.it> in April 5.

Silva, S. (2014). Cantinas universitárias servem menos um milhão de refeições. Jornal Público, April 20. Retrieved Jun 3, 2014, from http://www.publico.pt/sociedade/noticia/cantinas-universitarias-servem-menos-um-milhao-de-refeicoes-1632867

Stoll, C. (2000). High-tech heretic: reflections of a computer contrarian. New York: Anchor Books. 240 p. ISBN 0-38548-976-5.

Tapscott, D. (2009). The impending demise of universities. Retrieved May 18, 2014, from http://edge.org/conversation/the-impending-demise-of-the-university

Vassiliou, A. (2014). A new approach to ranking universities worldwide – with the personal touch. European Commission – SPEECH/14/370. Retrieved May 20, 2014, from http://europa.eu/rapid/press-release_SPEECH-14-370_en.htm

Volokh, E. (2008). Breaking the Law – DeMorgan's Law. Retrieved Jun 3, 2014, from http://www.volokh.com/posts/1205277114.shtml

Vygotsky, L. S. (1998). Aprendizagem e desenvolvimento intelectual na idade escolar. In: Vygotsky, L. S. A formação social da mente: o desenvolvimento dos processos psicológicos superiores. 6 ed. São Paulo: Martins Fontes. 191 p. ISBN 85-336-0818-7

Walker, R., Horsley, M. (2012). Should Australian schools ban homework? The Conversation, November 13. Retrieved Jun 14, 2014, from http://theconversation.com/should-australian-schools-ban-homework-10295

Weiser, M. (1991). The Computer for the Twenty-First Century. Scientific American, pp. 94-10, September. Retrieved Jun 10, 2014, from http://www.ubiq.com/hypertext/weiser/SciAmDraft3.html

Williams, L. (2011). Disrupt: Think the unthinkable to spark transformation in your business. New Jersey: FT Press. 198 p. ISBN: 0-1370-251-49.

Wyatt, R. (2001). Web-based teaching: The beginning of the end for universities? pp. 575-583. Retrieved April 26, 2014, from http://www.ascilite.org.au/conferences/melbourne01/pdf/papers/wyattr.pdf.

Yim, J. D. (2010). Featured on Nokia N8 TV commercial “It’s not technology, it’s what you do with it.” and Nokia N8 global promotion campaign, Sep. Retrieved May 15, 2014, from http://www.youtube.com/watch?v=zULDfSS7h20