UNLIMITED I: *ON THE CORPORATE TRAINING REVOLUTION*

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ABSTRACT

The unlimited is a borderless territory where the whole world pertains. In this study, it is shown that the unlimited is present in education and, specifically, in the corporate educational arena. Helped by technology and automation, disruptive leaders are challenging the way things are done, the way we think and, in addition what we are. After performing a documentation analysis, conclusions are that big problems –as education- need cheap and scaled technology; leadership and organizations must evolve to less human intervention; education and training need a rethought; Eduaction-2-Employment (E2E) is key for unemployment; and that new educational structures, delivery methods, pedagogical approaches and advanced Learning Management Systems (LMS) are observed proposing huge transformations in the corporate educational arena. This is a qualitative investigation with a not experimental and transversal research design.

Keywords: Unlimited; Disruption; Machine Learning (ML); Education; Corporate Education; Corporate Training; Skills; Abilities; Education-to-Employment (E2E); Technology.

1.   INTRODUCTION

What is being taught and learn today are part of the past. Modern technologies are not only shaping new structures, new delivery methods and novel pedagogical approaches which are changing the educational environment, but also what we think and what we are. The unlimited, the unknown, the blurred is present in the society and in the human being, proposing new uncertainties and novel limits that education must take into consideration.

Big problems -like education, and specifically corporate education- could be tackled with modern technological solutions like big data, intelligent technology and visionary thinkers. They require fresh tools and new ways of thinking and doing. For example, cheap technology -like sensors- and a new utilization of existing advances, like drones and intelligent technology (MERCADO-TECNOLOGÍA, 2016). With this perspective in mind, Schwab (2016) suggests that one of the biggest challenges that we are facing is to implement technology at scale and at an affordable price.

Taking into consideration a different point of view, Vamos (2016) says that digital disruption and technology are amplifiers of people's potential, and that automation is increasingly replacing humans (BELLUCCI, 2016) on more skilled jobs (DEWHURST; WILLMOTT, 2014; VAMOS, 2016).

It is observed that technologies are affecting the different areas of an organization and the classroom, too. According to Glenn (2008) and thanks to technological innovation, there is a change in the way universities teach and students learn, and that it is not only about the field of study but also the skills/abilities that are necessary to be applied to the workplace.

But, as the learning process is not only for humans because machines learn, too. There is a whole new world waiting for us in the future through Machine Learning (ML), more intelligent people and unimaginable technological things like algorithms (MERCADO-TECNOLOGÍA, 2016).

Reflecting on the role of education in society and seeing it from a wider perspective, education is not only focused on growth, improvement and collective well-being (PÉREZ LINDO, 2009). It may be a search for meaning (ABBOTT; MAC TAGGART, 2010; WHARTON@KNOWLEDGE, 2016) and a connection to an end

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(STACK; COULTER; GROSJEAN; MAZAWI; SMITH, 2006; CUBAN, 2003; BURBULES 2004).

Additionally, huge changes in many professions are predicted while diverse technologies –like big data, analytics, artificial intelligence (AI), Virtual Reality (VR), 360 3D, robots and algorithms- are taking place. Many professions will disappear, and new ones will arise. Degrees in sciences, engineering and mathematics will be required; also, abilities that machines still don't have (critical thinking, creativity, empathy or negotiation) or very specific knowledge. Organizations and certain tasks will change as robots and automation will substitute humans in many sectors (TRAUTMAN, 2016; MERCADO-TECNOLOGÍA, 2016, PYLE; SAN JOSE, 2015; CHUI et al, 2016).

In this sense, Education-to-Employment (E2E) became a key issue for organizations[1] and individuals because youth unemployment, skills/abilities development, adequate content base and inconveniences in learning and training are –actually- main issues (MOURSHED; PATEL; SUDER, 2014; IPROFESIONAL-MANAGEMENT, 2016)). These problematics are emphasized in emerging countries like Argentina (BULLRICH, 2016).

As a result, lifelong learning remains a fundamental aspect to remain competitive and enhance possibilities (IPROFESIONAL-RECREO, 2016; SCHWAB, 2016).

Complementing what it was said and in the business arena, value added is referred to the creation of an individual and/or organizational competitive advantage; it is basically a key element for their future sustainability. Taking a wider point of view, Vamos (2016) understands it as a combination of inspiration with technology, although there is a massive mindset gap between the world we operate in and the potential of people and technologies, and also between what we should be thinking and what we think. And as mistakes are learning, the "control oriented" and "know it all" mindset should give its way to the "learn it all" and "fail-wanting to learn" mindset.

This study proposes that these revolutionary changes are seen and must be reflected -in the educational/corporate educational arenas- in:

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[1] In this study, organizations must be taken in a broad base, including commercial, government, non-government and educational institutions.

- A novel educational structure, with Corporate Universities and/or expert's corporate training.

- The way we collaborate, with research partners around the world.

- How we teach and learn, with new pedagogical methods -like flipped schools- our education delivery, as distance learning. In this sense, multi-dimensional or hybrid programs (physical + online) and multi-modal teaching are increasingly making their road.

- How education is being managed, with advanced Learning Management Systems (LMS).

In this environment -were big social problems can only be tackled with modern inclusive technologies and fresh tools, and the unlimited is the blurred terrain where our planet is immerse- every social actor must become a change agent with a new role in order to make a better contribution to society. For example, in organizations, top management and senior leaders should enhance culture and productivity through the identification of areas for automation, prioritizing transformation and value generation.

1.1.   Objective of this investigation

To explore on modern technologies and automation, that are shaping new structures, new delivery methods and novel pedagogical approaches within the educational environment, proposing elements to improve the experience and results, specifically, in corporate training.

1.2.   Design: Methodology and analysis

As this is a qualitative investigation, conclusions cannot be generalized but this study may be useful for decision making. It explores and describes information of relevant authors and specialists gathered in the period Sept. 2016 – Jan. 2017.

The investigation design is not experimental and, among them transversal as it is referred to a precise moment in time.

The analysis unit includes the study of some modern technologies that are reshaping the educational environment and the corporate training, in general. Important secondary sources were used to complete this review.

This study was performed in Buenos Aires, Argentina.

1.3.   Research limitations/clarifications

The information included in this analysis is the one that was judged to be needed in order to support -in a reasonable way- the basis of this investigation.

As this study is based on a bibliographical review, it was not used an empirical analysis.

Conclusions are based on what is exposed in this study and -as a qualitative research- results shown cannot be generalized; however, they may be useful for management decisions.

1.4.   Findings

The unlimited is a borderless territory where the whole world pertains. It covers and applies to society, human being, science, and business; the whole planet and its structures. It is the domain of the blurred in a global environment composed also by industrial sectors, organizations, processes, and activities; and education – specifically, corporate education- is not an exception.

Modern technological advances and new understandings on knowledge and skills/abilities generation are imposing a transformation on organizations and leadership, and a rethinking on education and training.

In the following paragraphs, there are shown the fundamental findings of this study:

- Big problems –as education- need scaled technology at an affordable price and automated replies, but also visionary thinkers and new utilization of existing advances. As human-machine intelligence is a continuous learning process, it is not possible to predict the future curve of progress, for instance, on corporate education.

- Leadership and organizations must be transformed to less human intervention. Leaders with human touch should distinguish when to implement physical or knowledge automation, identifying areas for automation and prioritizing processes and activities to be transformed. His/her role is to do what machines cannot: ask good questions, evaluate information and interpret results.

- Education and training need a rethought as –thanks to online education and novel tools- new boundaries are being reached in the educational context. As teachers must be more inspiring and pupils should have more desire to learn, new perspectives will come from novel hybrid programs, and actual and applicable contents. Also, from redesigning courses -multi-modal classes-, online material and homework.

- Education-to-Employment (E2E) is fundamental to reduce youth unemployment in the world. It is remarked that: a) there is a lack of relevant skills for the workplace and appropriate career strategies, b) employees should observe learning as a benefit and as better marketability, and c) lifelong learning is a worker's responsibility, not company anymore.

- Are observed new educational structures –like CU and expert's corporate training-, new delivery methods -like distance learning/e-learning (DL)-, novel pedagogical approaches -as flipped schools- and advanced Learning Management Systems (LMS) that are proposing a transformation in the corporate educational arena.

1.5.   Originality and value

Thanks to technology and automation, education –and specifically, corporate education- is under an unprecedented transformation. As the future is part of the unknown, it is not established what will happen, although elements are shown that are reshaping what we do and what we think.

As a result, this study may help leaders, executives and entrepreneurs when thinking about the future and taking important training and educational decisions in their companies.

2.   TACKLING BIG PROBLEMS THROUGH TECHNOLOGY

An increasing worldwide population is facing big problems like economic exclusion, feeding shortages and educational access. To tackle these big problems Mercado-Tecnología (2016) suggests that technology is proposing more advances than perils: machines with a brain capable to take decisions, algorithms with solutions for everything, Internet of Things (IoT), Artificial Intelligence (AI), data ownership, and technified agriculture.

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Specifically on the feeding shortages problematic, the article refers to a Thomson Reuters' report -called 9 Billion Bowls- were analysts, scientists, students and inventors are using big data and different technologies to fulfill the dream of feeding the 9 billion people that -by 2050- will live in our planet.

The challenge that is proposed is how to feed the population in the future and in a sustainable way, ending with food shortages. It is said that the feeding problem may be attacked with modern solutions like big data, intelligent technology and visionary thinkers, in order to obtain the best results from the food supply chain. There are referred different examples in which this is possible:

1. Installing sensors of $3 in rice plants to detect a pathogen agent without any specialist's job, and saving farmers a lot of money.

2. Using drones to evaluate crops, give supplementary data and help to increase seed production, helping feeding the world. Drones produce a progression of images on crops suffering, integrated with other sources like weather forecasts, and the maps show points where farmers must go to evaluate the problem.

3. Thompson Reuters Foundation -through Data- is helping farmers around the world to tackle the problem of food insecurity. Data connects different points like politics, climatic change, economy, finance…and whatever it may be considered to solve this problem. But still there are climatic surprises. That is the reason why, in several of the most important agricultural emerging countries, governments should help scientists to improve their climate models with real observations.

As a conclusion of this section, big problems -like economic exclusion, feeding shortages and educational access- can be tackled by visionary thinkers and institutions through cheap technology (like sensors) and new uses of existing advances (like drones and intelligent technology).

Existing problems require fresh tools and ways of thinking and doing; there's a lot of change to be seen in the near future in the mentioned areas.

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3.   THE POWER OF AUTOMATION

Machines are increasingly replacing humans and creating new opportunities. According to Bellucci (2016), in the next 20 years +700 jobs –more than half of the jobs that are made by humans- will be performed by machines, like robots or other intelligent machines. If that happens, workers will lose their jobs, being a trend that will affect emerging and developed countries. The most impacted areas will be transport, production, agriculture, routine functions (like toll collection) and sales to consumers (like supermarkets' cashier).

For instance, IBM made freely available to the public the supercomputer Watson to make data analysis, statistical predictions and business planning. Watson can do it with no cost at all and in less time than any qualified professional.

Bellucci argues that in a first stage, automation will transform areas like administration, logistics, marketing and services, but in a second one –and thanks to advances in Artificial Intelligence (AI) - it could replace specialists in science, engineering and art.

Finally, proposes that -as in the Industrial Revolution- automation will pose enormous challenges in the education and labor areas. As an example and thanks to big data and cheapest sensors, a robot may make a more precise surgery than a physician, write legal texts, offer psychiatric counseling and take care of elder people.

Likewise, Glenn (2008) states that technological innovation –like distance education, opportunities to collaborate with research partners around the world, and new Learning Management Systems, LMS- is changing the way universities teach and students learn, and this is a great possibility for academic institutions.

Some of the conclusions of her study are that:

- Technology had and will continue to have a huge impact on higher education (for instance, in teaching methodologies), being a differentiator in attracting students and corporate partners.

- This generation (digital natives) handles very well with online, and online learning is being offered in most of the universities. It is considered key to advancing in their mission; for instance, with corporate-academic

partnerships. One of her conclusions is that a commitment to advanced technologies is necessary to attract corporate partnerships.

- The online –which offers specialization, customization and convenience- was once considered a niche channel for delivering educational content, but now it became a mainstream, including new students, new markets and expanding revenues.

- Multi-dimensional or hybrid programs (physical + online) are preferred to one-dimensional programs (physical only).

- Multi-modal teaching is possible thanks to technology. That is the reason why technology-based teaching criteria must be re-weighted. As an example, there are universities that film classes and then students can review them supporting individually paced learning. Others are experimenting/advanced with tools like wikis, instant messaging, online gaming, simulations and web applications, freeware (such as Google docs) to produce profound changes in the way courses are taught.

- Teaching must focus on the application of knowledge to specific problems, not on memorization. For that reason, teaching will be more outcome-based than student-centered.

- Although more positive than negative impacts and thanks to globalization, technology, distance education and online degree programs will help to have foreign locations and make education more inclusive for many more individuals around the globe.

- Not only an education in the field of study becomes important, there are also needed skills and knowledge required to leverage technology effectively in the workplace. In this sense, only 40% of respondents believe that current graduates are able to compete successfully in today's global marketplace. As new generations are not content with passive involvement in education, private employers assume that some on-the-job training will be necessary to acclimatize new employees.

- Technology is important for differentiation and cooperation with other universities. As small universities cannot compete on resources with bigger

ones, it is necessary for them to focus on niche offerings. That is the reason why the main hurdles that technology must face are related to cost, organizational culture to include technology-based teaching criteria, and low CIO's involvement in strategic matters.

- As new technologies are affecting the classroom and other areas, high school must ensure that infrastructure and operations are in place to support the adoption of technology on campus. Some examples: social-networking tools help to build connections with alumni and support career service activities; e-marketing campaigns are expanding the reach and success of recruiting and fundraising, driving down the costs; and automated self-service programs reduce administrative and registration costs, improving academic life.

- Having a dynamic delivery of contents that will adapt to each student's performance, the future of higher education will be on courses that will vary in length, rather than semester-based.

  It will be seen more interdisciplinary majors and inter-university collaboration (examples, students from different institutions may work together on a given topic and/or mix and match classes from different institutions to meet degree requirements, customizing their degree).

  Homework and quizzes should be re-designed to require genuine thoughtfulness from the student's side, advancing on educational quality.

  A more interesting range of possibilities will affect academic offering with interdisciplinary majors, combining –for instance- chemical engineering with environmental studies and/or letting students to craft individualized degree programs with their university, or by bundling coursework from different institutions.

  Online materials will replace textbooks proposing an evolution of the publishing world.

  These elements will lead to pursue more specialized certification programs and degrees, transforming the professor's role from instructor to mentor.

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- As technology is changing the skill-sets of the future workforce and its approach to work, it will be required to set up the right approach to remain competitive in an uncertain global marketplace.

On robotic, there are different authors and publications that predict huge changes in many professions, and –as a consequence- in the way they are learned and teach. Professional-Recreo (2016), based on Schwab (2016) and other specialists - suggests that:

- Work will be transformed because of digitalization and automatization of tasks, and that the Fourth Revolution has begun.

- Many professions will disappear as we know them today (like lawyers, financial advisors, physicians, journalists, accountants, insurers, librarians) while new ones will require more specialization and creativity.

- The most relevant professionals will be the ones that will adapt to changing environments, with degrees in sciences, engineering and mathematics.

- Abilities connected with the ones that machines will never have -as critical thinking, creativity, empathy or negotiation- will be very important in this new context.

  It will also be required knowledge and experience on digital communication and social networks; team building and networks; Internet information; customer focus and continuous learning.

  There will be advanced users who will be in the position of selecting data and turning it into useful business information for decision making, but mechanized or automatized workers and positions with low value added will be in peril.

- We are living a super technological change that will affect organizations and people. Organizations will be flatter, and must gain in competitiveness, agility, and customer focus, working in teams with tools that today don't exist. People will change the way they communicate because technologies allow employees to work from anywhere and anytime.

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- Robots will substitute human beings in many sectors, and new tasks will be done by human beings as machines are not able to do them (for instance, digital solutions and management of digital businesses).

- For some specialists, it will be more important the abilities related to the personal attitude than a degree. For instance, many times the projects are not defined and there are needed people who may adapt to change and like the firm. That is why there will be needed employees (they call them "nomads of knowledge") that may work in different projects -that require different competencies and characteristics - creating value inside the digital environment.

- For sure, we will face a transformation, like what we've seen in the automotive sector, with community managers and software architects that didn't exist before.

- One of the basis for all this is lifelong learning, and workers must take care themselves of their retraining, enhancing their possibilities and professional career. Some specialists conclude that anybody can be what he/she wants and this is an enormous challenge for everybody.

Moreover, Grothaus (2015) is convinced that first this world left the agricultural sector without workers and then this happened to the industrial sector. Now, machines come for the third sector and then -in the next decade- for the white collars, which means that some of the most desired jobs today may be obsolete in 2025, giving some examples:

- The first line military personnel may be replaced by robots, drones and other machines; wars may be done through a remote control. On the other hand, new positions will be open in the control/machine rooms of these wars with drone operators, robot designers and experts in cybernetic war.

- Algorithms will replace private bankers and fund managers. In the near past, the operators who acted in the Stock Exchange floor and the majority of office operators were eliminated by algorithms, and the next group will be the financial experts who make business and administer personal funds.

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- Artificial Intelligence (AI) will replace lawyers, accountants, actuaries and engineers; every professional who manages information will be replaced by AI or an algorithm.

But history says that in any way the labor market creates new positions while others are destroyed. The author gives some examples of new jobs that will be created:

- *The increase of "on demand" workers*: 25% of actual full time employees will work on demand (freelance). Additionally, any work that can be done remotely will be attractive to companies, even when seeking to hire "top-level professionals who can solve significant problems for companies." As a result, new abilities will be needed: self-administration, self-promotion, marketing and self-development.

- *Professional triber*: will have the role of assembling teams as many workers will work on demand.

- *Freelance Professors*: learning will move to the labor world and it will be highly demanded. As online courses will promote independent professors, what will be needed to create a university are a great learning style online, materials and a marketing plan.

- *End-of-life planner and Grandparents' caregivers:* In 2100 the planet will have 4 billion people more and by 2025 63% of the population will live +65 years, and some more than 100 years. The end-of-life planner and the grandparents' caregivers will become jobs in great demand.

- *Long distant caregivers:* these specialists will help –remotely or virtually-local and regional caregivers, who will take care of urgent diseases. With iOS 8 and the integration with Apple Watch applications, Apple employees will be the best paid and it is probable that it will be the world leader firm in proactive and remote health care.

- *Neuroimplant technicians:* Neurotechnology will be an explosion; it can happen from digital telepathy or to discharge our minds in a computer.

Also, the capacity to understand our brain is increasing at high speed, so there will be needed brain surgeons, neuro augmentation, and implant technicians

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and designers, brain content recording engineers, magnetic resonance specialists, and neuro robotic engineers to create robots and mind-controlled machines.

- *Smart house service specialists*: for 2020, the smart house market will have revenues of $19 billion. A lot of new jobs will be created, not only for engineers but also for people who understand technical matters, like smart houses installers or people who may put internet of things at home.

- *Virtual reality (VR) experiences designer*: VR will be used for work and entertainment, and the ones who may design VR experiences will be demanded. Offices may be obsolete if somebody can interact virtually from home with colleagues as if they were in the same room. Entertainment at home will change if VR enters into our lives; a TV of 72" and -in 2025- PS4 will be archaic like Internet or smartphones. VR will be used in every aspect of life to make it the more real as possible, from trainings and conferences to tourism and leisure, requiring directors, actors, designers and programmers.

- *3D design specialists*: 3D printers are a solution for the production and industry of prototypes, but as the great majority of consumers don't have interest in learning how to use them it means that there will hire people to design and print objects.

Addiitonally, Diario La Voz (2016) cites an American digital consultant Scott Klososky who says that firms won't replace all its employees with robots, but because machines will replace humans in many jobs, in the next 20 years 35% of actual jobs will disappear. Moreover, it is offered the following information:

- Out from a Google study, 60% of buying decisions are done without a salesman intervention.

- In the future, a contact center will have minimum human intervention.

- 65% of Internet searches finish with a commercial transaction.

- 71% of people, especially young ones, make purchases based on the references they receive through social networks, without consulting their concerns with someone else.

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- Every firm will have to find the perfect mix between humans and technology to increase profits, maintain a trained and efficient staff, and give a value added on emotions that AI doesn't have. The final objective is to integrate people and technology (called homology) to give the best customer service.

At this point, there may be some questions that we may ask to understand if organizations -specifically, universities and the commercial ones- are seeing the future as it comes:

- *Do we have a thought on our positioning to the future?*

- *Are we taking the online and other technologies as a value added in our offering?*

- *Are we considering the new positions that will be created in the future as part of our curricula and our areas to develop?*

- *Are we leaving aside de professions that will disappear and reshaping the ones that are in the process to change?*

- *Do we have a thought on skills/abilities and knowledge that are required for the future?*

- *Are we shaping the right leadership?*

Complementing what it was said, technology may be seen as a tool if it is in human hands, and knowledge as the intersection between human inspiration and technology. In this sense, Vamos (2016) indicates that:

- Digital disruption is a human thing; technology doesn't innovate or disrupt yet, people do it. Technology is an enabler or an amplifier of people's potential.

- Today we have access to a huge quantity of knowledge. This is the reason why value is understood as a combination of what somebody knows and who he/she is connected with. For that reason, people can do many things when they combine their inspiration with technology.

    Additionally, everything is about change; changing things for the better and to whatever things you would like to see them.

- There is a massive mindset gap between the world we operate in and the potential of people and technologies to do great things. There is a gap

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between the way we've been taught to think and the way we should begin to think.

- As change is human, organizations do not change; people change and always it is confronted with fear. Fears will be always, but what could be change is the conditioning that we have when we work together.

- Coming from an industrial past, the mindset that dominates today is to be under control ("control oriented") and give the right answers to the questions that were asked ("know it all"). Bust past success and knowledge is a killer.

- The first lesson is that success goes to the open minded; it is much better to be a "learn it all" rather than a "know it all".

The second lesson is on purpose: review constantly why you do what you do, what is relevant to the ones that are around you and the ones you want to serve, and how you add value.

It is important to ask where we are going, what are our priorities and if all the work we are putting in will be successful. That's the importance of design thinking today: to reflect on different matters, get feedback, and not to be diluted by stakeholders.

Another lesson is that mistakes are learning: it is impossible to be good at something without committing mistakes. Life is try-fail-learn. As a result, the big shift is from the "control oriented" mindset to a "connected-caring-willing to try and fail-wanting to learn" mindset.

- As change agents, people must appreciate what they are confronting; you cannot ignore it and help people who think the old way.

- Believes and thoughts may change. The question is why you believe/think what you believe/think. For this reason, it is necessary to hear the inner voice and other voices that -at the beginning- could be far distant from our beliefs and thoughts, not discarding them.

As a consequence, there is an enormous potential in people who must be developed through listening and learning.

As a conclusion of this section, the "learn it all/ connected-caring-willing to try and fail-wanting to learn" mindset should take place to be in accordance with the volatility and changes that we are facing. Inevitably, automation will take the place of many jobs that exist today, and human beings will be called to do better and more skilled jobs, otherwise they will be in trouble.

Big data, analytics, algorithms, sensors, robots, AI, and the like are making their road to the future, and people –as change agents- must adapt in what they do, believe and think. Digital disruption will be what humans want, as change is human and fear, too.

People and organizations' potential could be amplified if technology is used in the right way and positioned to the future. Some of the lessons that must be considered for success are connected with being an open minded, reviewing constantly what and why something is done, and that mistakes are learning. The "control oriented" mindset should be part of the past as it is not the bridge to the future.

In the following Tables, it is shown a more detailed summary of this section:

Table 1: The power of automation - Context

Area	What will happen?
Digital disruption and Technology	• Digital disruption is a human thing. • Technology is an enabler or an amplifier of people's potential, and is important for differentiation and cooperation with other universities. • Technologies are affecting not only the classroom but also other areas like infrastructure and operations.
Work, professions and abilities	• Work transformation and many professions will disappear. • As competition is harsh, there are needed education, skills and knowledge to be able to compete. • New professions: on demand workers, professional triber, freelance professors, end-of-life planner, grandparents' caregivers, long distance caregivers, neuroimplant technicians, smart house service specialists, VR experiences designer, 3D design specialist. • Abilities will relate to the ones that machines will never have: critical thinking, creativity, empathy and negotiation. • Personal attitude could be more important than a degree.
Sectors involved	• Agricultural and industry (already happened). • Third sector and white collars (about to happen).
Organizations & Universities	• Flatter, competitiveness, agile and customer focus. • Work in teams. • New tools like big data, analytics, algorithms, sensors, AI and robots. • Less human intervention. • Will need to find the perfect mix between humans and technology.

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Table 2 - The power of automation – Learning process

Area	What will happen?
People	• New ways to communicate. • Technologies will allow to work anywhere and anytime. • Advanced users will select data and turn it into useful business information for decision making. • Mechanized or automatized workers and positions with low value added will be in peril. • Must combine inspiration with technology. • Change comes with fear.
Learning process & New mindset	• Digital natives are prone to online education, which offers specialization, customization and convenience. • Hybrid programs and multi-modal classes should be focus to application of knowledge, not memorization. Teaching will be more outcome-based than student-centered. • Things that will change the educational environment: dynamic delivery of contents, courses that will vary in length, interdisciplinary majors in different institutions, redesigned homework and quizzes, online material, specialized certification programs and a mentor's role for professors. • Workers will take care of their own lifelong learning and retrained. • Gap between the way we've been taught to think and the way we should begin to think. • Deal with opposite mindsets: Control oriented/know it all versus learn it all/connected-caring-willing to try and fail-wanting to learn.

4.   A MORE INTELLIGENT INTERACTION HUMAN-MACHINE

Human and machine intelligence responds to a learning process, for which the world will change abruptly in the next decades. Machine intelligence is being managed by more and more refined algorithms that will build a new market to buy and sell them. As a result, the value of firms will come from the value of their algorithms that will convert data into action, and the impact that they will have on consumers.

Also, a different kind of interaction human-machine comes with new technologies that are being applied in new fields. Trautman (2016) says that Virtual Reality (VR) is entering the music industry, with novel ways of experimenting it live. There are new ways of consumption and interactions with instruments, and also with favorite artists.

There is a combination of technologies, like 360 with 3D -which allows interacting with what happens in the screen with the musical theme- to navigate and/or discover new worlds by one's own. Adds that VR lets learn to play instruments, to feel that somebody is in the show or bring it to your house, and/or

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interact with friends that are not with you. It is shown that VR is transforming the experience of music consumption in the present and in the future.

In the following paragraphs, all these inconveniences will be presented in accordance with important secondary data.

4.1.   Not only humans learn, machines learn too.

Human and machine learning are transformation many industries. Mercado-Tecnología (2016) cites that to learn is not a human capacity only; machines are doing it, too. Moreover, Alan Turing -one of the computing pioneers, who works in AI-, gave his name to a test (Turing Test) that measures the machine ability to show an intelligent conduct.

But still those machines don't have inspiration or imitate the human brain. They use an enormous quantity of data to find results that may associate with human intelligence. A case is the autonomous car -that performs an important task- but it would not know what to do if we suddenly put it in charge of an airplane; or a computer can win the Jeopardy but have no idea of what to do if we proposed a game of chess. That does not devalue machines' achievements, but the borders are moving the benchmark for AI farther and farther.

In this sense, Pyle & San Jose (2015) are convinced that -based on cheap computing and digitalization- scientists train computers to build finished models, and that the volume and complexity of big data have increased the potential of machine learning. As a result, computers may be programmed for objects recognition through programs that identify visual elements of any picture with a high degree of accuracy. In addition, they suggest that:

- Machine Learning (ML) –built on statistical inference and artificial intelligence from bigger data sets, so making predictions with ever-higher degrees of accuracy- is not like learning in the human sense, but chewing in any amount of data and every combination of variables. It will turbocharge business models redirecting their competitive significance.

- Traditional industries are using ML to gather fresh business insights. For instance, in sports and by digitalizing the past few season's games it is possible to create predictive models that may allow a coach to distinguish the

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best and worse practices of their opponents and adjust decisions accordingly. As an example, General Electric manages the data collected from deep-sea oil wells or jet engines to improve and optimize performance.

- Outside USA, it is used in European banks where they can replace older statistical-modeling with ML techniques experiencing increases in sales, cash collections and savings. They also built models that accurately forecast clients who will cancel a service or default on their loans, and how best to intervene. In addition, three algorithms were used to examine scanned résumés and predictions strongly correlated with what happened in real-world: more than 10,000 potential recruits would have been accepted.

- As a consequence, continuous and automatic experimentation will help to optimize the organizations' business processes, yielding insights that human analysts cannot see by their on.

- C-level executives may use ML to craft and implement a strategic vision, too, better than using it only for "minor matters" like acquiring, stimulating, and retaining customers.

- It concludes that analytics should be democratized, encouraging data sharing. Also, that databases will give new insights into the past and produce sharper predictions of behaviors and outcomes in the future. Finally, that it will help prescriptions, changing the way man-machine work today; man will have to translate data, interpret data and recommend a course of action, redirecting algorithms to new levels of knowledge.

- Only human managers will decide on essential questions, such as the critical business problems a firm is trying to solve. As human beings, these machines will need to be evaluated and refined; both –humans and machines- will be the winners if they work together.

As a consequence, intelligence should be distributed no matter how if it comes from humans or machines, and intelligence should be the basis of education and training.

Moreover, Chui et al. (2016) indicate that:

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- Automation technologies -like ML and robotics- are increasingly having an important role in everyday life, affecting the workplace and research.

- It will affect portions of almost every job transforming not only manufacturing but also other sectors with a substantial share of knowledge work like healthcare and finance. With technologies available today, more than 30% of activities could be automated from 60% of all occupations.

- There are higher, lesser and less susceptible activities for automation. In addition, there are varying degrees of technical feasibility but specifically in educational services areas -characterized as knowledge work- like managing others, applying expertise (decision making, planning and creative tasks), stakeholder interactions and unpredictable physical work (done in unpredictable environments) are considered the less automatable activities. Still, humans need to set up goals, interpret results or provide solutions, and in healthcare and education human interaction is fundamental.

  In the educational sector, the more automatable activities relate to data collection, data processing, and predictable physical work (most   performed in sectors like manufacturing, food services, accommodations and retailing).

  "Yet the essence of teaching is deep expertise and complex interactions with other people", being the least automatable activity identified in the study (about 50% of all the activities of the education sector). That is the reason why the most automatable activities are the ones that happen outside the classroom. For example, janitors, cleaners, cooks, and administrative assistants, though administrative expenses and costs may be reduced, assuring a better service quality.

- Preconditions for automation are:

  o The technical feasibility.

  o The cost of developing and deploying the hardware and software for automation.

  o The cost of labor and related supply-and-demand dynamics. For instance, if workers are cheaper than automation, this could be a decisive argument against it.

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o The benefits beyond labor substitution, like higher levels of outputs, fewer errors and better quality.

o Regulatory and social acceptance issues,

- The future of human work depends on automation and on customer demand growth.

- Technology is developing fast, and robotics and ML are making inroads into different activities that today have a low technical potential for automation. Thanks to new techniques, robots and humans are collaborating in unpredictable environments, like construction, and artificial intelligence is being used to design components in engineer-heavy sectors.

  If machines could develop an understanding of natural language -up to the point to recognize concepts in everyday communication- we would be in front of one of the biggest technological breakthroughs, and this could impact on retailing, finance, insurance and healthcare. In the future, robots may be cleaning your teeth or teaching your children.

- The technical potential for automation is not enough to end up on how much it will occur in different activities; a business case, the supply-demand dynamic of labor, regulatory and social factors also participate in its acceptability and implementation.

- Enterprises will have the potential of avoiding pitfalls and complexity, implementing not only physical automation (like robots in warehouses) but also the automation of knowledge work (like algorithms that may alert customers of items they may want to buy or shortfalls/excesses in inventories).

- Top management responsibility is to identify areas for automation and prioritize processes and activities to be transformed, unlocking value and raising productivity through improved quality, safety, speed, fewer errors and higher outputs, not from reducing labor costs. Senior leaders should work on improving cultural organization and processes and look where automation may be useful to enhance productivity.

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As digital platforms enable more connectivity between individuals, teams and projects, there are a whole range of activities that are possible to be automated. Managers must rethink which of the activities that they actually perform could be done by machines and focus on core competencies that only humans may do.

But machines not only carry orders, they also are replacing skilled professionals in many disciplines. Dewhurst and Willmott (2014) say that -as AI is taking hold- the times in which computers only carried orders are part of the past. They are replacing skilled practitioners in various fields like architecture, medicine, law, petroleum geology and aviation, and changing the nature of work. They cite that a Hong Kong venture (Deep Knowledge Ventures) applied a decision-making algorithm to its board of directors. The basic questions they pose is to what level and extension algorithms will take place inside organizations and what will be a Senior leaders' contribution in this context.

Their conclusion is that brilliant machines will take place and evolve only if managerial advances enable them to -as a lot of work should be done on data sets- and their potential for better decision-making and organizational development. In this ambience, the role of senior leaders should evolve through a human touch, attacking exceptional circumstances that come from algorithms and doing things that machines cannot, like tolerating ambiguity and focusing on the softer management side to engage people and build the necessary capacities for change and progress.

One inconvenience referred by the authors is the polluted or difficult-to-parse data, which implies a management problem that has taken place 50 years ago, since the IBM System/360. But it is not only about structured data; unstructured data like emails o social media may give additional hints on new management boundaries.

As a result, Dewhurst & Willmott suggest that customized dashboards - synthesizing information on different areas of the organization- may give an extra power to senior teams, but these dashboards don't create themselves. Also, parameters and targets (on risks and prices, for instance) must be set to flag data and escalate exceptions. AI opens up the possibilities of democratizing information and managing organization without bringing decisions upward; in other words, a better decision-process.

It is proposed a "Chief experimentation officer", who should observe early signals and will find the right abilities to experiment at scale.

In this environment, they suggest that senior leaders must develop skills that computers don't have, as asking good questions, interpreting outputs, attacking problematic exceptions and spending less time on day-to-day issues (like new credit limits or innovative services or products), and tolerating ambiguity, being in the state of unknowing while filtering and evaluating information, and waiting for the right moment when clarity emerges.

Finally, soft skills are fundamental to humans and organizations -more than ever- need a human touch. For instance, while inspiring and empathizing with employees and customers, and when developing talent or translating machine algorithms for the organization of messages.

In some way, machines will liberate a lot of executive's time, but also they are showing that the human dimension is needed on the edge of brilliant machines.

Moreover, Mercado-Tecnología (2016) insists that there are two basic perils for people to have machines with AI: 1) if they can think by their own and 2) it is possible to automate non-routine or mechanical work.

Moreover, the AI expands as a tool which is a fundamental part of the knowledge work; soon we will ask professionals to use all the tools at their disposal to do their job better. As an example, AI is utilized in finance to detect fraud in irregular operations and drones are used to have interactive maps for products and their offerings. But more data and complexity only remarks the importance of human work as machines give automated information and the human brain is what weighs the facts and makes the decisions.

In fact, in history there are many cases in which humans had to take control of the situation, with driverless cars and with aircraft automatic pilots. In fact, humans must be ready to intervene, otherwise the consequence will be a catastrophic loss of knowledge and skill; AI needs a brain and also to know how to use it.

In the following Tables, it is shown a summary of the main elements that were referred previously:

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Table 3: Automation: General

Area	Description
What's happening, in general?	• Human-machine intelligence is a learning process. The volume and complexity of big data have increased the potential of machine learning. • Automation technologies are affecting portions of every job, impacting in every industry. • Organizations must distinguish when to implement physical automation and knowledge automation. • New technologies (like VR) are being applied to new fields (like music). • Combinations of technologies are transforming the product consumption and its experience. • One of the biggest breakthroughs may come from understanding of natural language.
What's happening in specific sectors?	• Machines are replacing skilled practitioners in various fields. Ex.: A decision-making algorithm was applied to a board of directors. • In healthcare and education human interaction is fundamental. Teaching is deep expertise and complex interactions with other people. • In the educational sector, the more automatable activities relate to data collection, data processing, and predictable physical work . • In the future a robot may teach your children.
What machines still cannot do?	• Have inspiration or imitate the human brain. • Think by their own.

Table 4: Automation: Benefits-Inconveniences-Conclusions

Area	Description
Benefits of Machine Learning (ML)	• Make predictions with ever-higher degrees of accuracy. • Gather fresh business insights and create predictive models. • Replace older statistical-modeling. • Build forecast models for predictions. • Optimize the organizations' business processes. • Craft and implement a strategic vision.
Inconveniences of Automation	• Polluted or difficult-to-parse data, on structured and unstructured data.
Conclusions	• Analytics should be democratized encouraging data sharing, through customized dashboards. • The way man-machine work today will change. Man will have to translate an interpret data and recommend a course of action, and redirect algorithms to new levels of knowledge. • Humans must be ready to intervene: there are many cases in which humans had to take control of the situation, with driverless cars and with aircraft automatic pilots. • Intelligence should be distributed, being the basis of education and training. • Top management responsibility is to identify areas for automation and prioritize processes and activities to be transformed, looking for higher levels of productivity. • Brilliant machines will take place and evolve only if managerial advances enable them to. • The role of leaders: human touch, exceptional circumstances and do what machines cannot, like asking good questions, evaluating information and interpreting outputs.

4.2.   Changing the world with ML and more intelligent people

Mercado-Tecnología (2016) proposes that there are scientists who think that ML will change the world. For example, Vivienne Ming -entrepreneur, professor of theoretical neuroscience at the University of Berkeley and expert in human cognition

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and machine learning- is studying natural intelligence -out of AI- in The Machine Perception Lab. This Lab was conceived to create machines that learn to understand the brain and then how it is possible to apply that. As a result, Ming is interested in finding out if it is possible to make people smarter by connecting their brains directly with technology.

Additionally, some time ago Ming began to work on the idea of how ML could revolutionize the recruitment of people, not doing it in the abstract, but combating some of the pernicious elements such as sympathy towards a person and discrimination, habits so rooted in the system. Today, she has learned to predict who is the best for a position and recognize patterns which represent specific talents.

She is convinced that -what is coming in the next decades- is a revolution that will make people more intelligent. At the beginning, it could be possible to preserve mental capacities in Alzheimer patients and repair traumatic brain damages. Afterwards, there will be more as today they are working with animals and then they will begin with humans. She is working on a final conversion between machines and humans as he is convinced that it will be possible to pay more attention, be more creative and manage our emotions.

At the end, she is convinced that if instead of being proprietary of Apple, Google or Microsoft- is part of a neural distributed net, we will process our own data, not waiting for others to do it. At that point, each device will become a small processing node in a gigantic neural network and speak as the cells of our brain speak, share information, draw conclusions and –then- take advantage to make observations. As a consequence, the next big thing that will come with LM is to "light up" the world around us.

A complementary point of view on the change that we are facing is given by Schwab (2016), proposing that technology and digitization are changing industries, people and the whole society. That is the third revolution was about digitalization, but we are going through the fourth one which is about innovation. It is based on a combination of technologies, blurring the lines of the physical, digital and biological spheres.

Schwab insists that this technological revolution will change live, work and the way we relate each other; it won't change what we are doing, it will change us. This

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transformation will not be connected with anything that happened in the past but response must be integrated with every stakeholder, from private and public sectors to academia and civil society. It will be connected with the creation of a new story of the way we would like to live.

In addition, the specialist suggests that there are technological trends driving this revolution, like AI, 3D printing, IoT, robotics, synthetic biology, big data, quantum computing, social media, autonomous vehicles, nanotechnology, biotechnology, energy storage, and entrepreneurial innovation in the developing world.

Also, the velocity of changes, their scope and systems impact, are announcing the transformation of entire systems of production, management and governance. Efficiency and productivity on the supply chain side will be a miracle as costs of communication and transportation will drop, opening new markets and driving new economic growth.

Schwab (2016) agrees with Mercado-Tecnología (2016) that there will be a disruption in the labor market, as automation and robots will substitute human labor across the whole economy, but the remaining jobs will be safer and more rewarding. As a consequence and in the future, Schwab says that talent –more than capital- will represent a critical factor of production, segregating the job market in "low skill-low pay" and "high skill-high pay" segments with increasing social tensions and inequality. The result will be a job market highly demanded in the high and low ends, but with a deep hole in the middle.

Providers of intellectual and physical capital –innovators, shareholders and investors- will be the largest beneficiaries of this innovation huge wave.

Moreover, social platforms are widely used for many more people around the globe. Schwab (2016) understands that social media platforms are used to connect, learn and share information and more than 30% of total population utilizes them, offering unrealistic expectations of success and opportunities to propagate ideas and ideologies all around the world.

In accordance with the author, the impact on business comes from the acceleration of innovation and the velocity of disruption. Also, digital platforms -which create rapidly multiplying businesses and lower the barriers for wealth creation- may put out of business well-established incumbents faster with better quality, price

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and/or speed products than before. From the demand side, consumer engagement, transparency and new consumption patterns are forcing companies to adapt their offers.

As a result, four main effects on business are cited: 1) on customer expectations, 2) on product enhancement, 3) on collaborative innovation and 4) on organizational forms. Some key drivers as new technologies, digital capabilities, big data and analytics are transforming the way business is being done, imposing a profound rethought on what is being done and how.

On the government side, the specialist alerts that citizens will be engaged with public authorities, giving suggestions, collaborating and coordinating efforts. Central power will be decentralized and redistributed thanks to new technologies, and transparency and efficiency will help governments to survive.

The impact on people will be huge; it will not only change what we do but who we are. It will affect identity (privacy, ownership, consumption patterns, time devoted to leisure and work, nurture relationships and meet people) and technology may apart us from important things like the time to pause and/or reflect and engage in profound arguments. As a consequence, moral and ethical boundaries will be also redefined.

The author insists that -in its worst side- this Fourth Revolution may be seen as a dehumanization and robotization of humanity, but also as a complement to the human nature (compose by creativity, empathy and stewardship). It all depends on us.

As a consequence, recommends a new education, a new training. As an example, General Motors is encouraging students from primary schools to experiment with robots and help them in creating new things. In different young people it is seen that they come out with some knowledge that hasn't come from schools. The world is open to learning and the problem is how to incentive people to do that.

The author concludes that -for the reasons mentioned above- digital technologies can change outcomes and empower people around the world who can

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create a more equitable globe, making inequalities invisible and less acceptable[2]. To have the basis of a new starting point, it is essential to free to an open society in which to think, create and diverge. One of the biggest challenges is to implement technology at scale and at an affordable price, recognizing that everyday problems will have a different set of solutions.

Also, Floridi (2014) speaks about a fourth revolution, with computing science and IT teaching us lessons of who we are and who we can be, now that we have more artificial entities and agents around us.

The following Table shows a summary of what it was presented before:

Table 5: Changing the world with ML and more intelligent people

Area	Description
What are new studies about?	• Work is in progres to create machines that learn to understand the brain and apply that. • People could be smarter by connecting their brains directly with technology, being possible to pay more attention, be more creative and manage their emotions. • Better predictions could be made without pernicious elements such as sympathy towards a person and discrimination. • We could be a node in a gigantic neural network and speak as the cells of our brain speak, share information, draw conclusions and then take advantage to make observations.
The fourth revolution Schwab (2016)	• It is about innovation and is based on a combination of technologies, blurring the lines of the physical, digital and biological spheres. • It will change us, not what we are doing. • Technological trends driving this revolution: AI, 3D printing, IoT, robotics, synthetic biology, big data, quantum computing, social media, autonomous vehicles, nanotechnology, biotechnology, energy storage, and entrepreneurial innovation in the developing world. • The job market will be segregated in "low skill-low pay" and "high skill-high pay". • Beneficiaries of this innovation huge wave: providers of intellectual and physical capital. • People will be empowered through a scaled technology at an affordable price. • It is needed a new education and training.

4.3. The algorithm economy

An algorithm economy is making its road among us. Mercado-Tecnología (2016) insists that as oil is nothing till it is refined and converted into gas, the same happens with data: it should be refined and converted into information. The conclusion is that data will be the oil of 21st Century and IoT will give place to the algorithm's economy.

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[2] The author coincides with Vivienne Ming, presented before, when she said that at the end if IoT – instead of being proprietary of Apple, Google or Microsoft- is part of a neural distributed net, it will be possible to process our own data, not waiting for others to do it and that each devise will become a small processing node in a gigantic neural network and speak as the cells of our brain speak, share information, draw conclusions and then take advantage to make observations.

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It is said that algorithms are present in our lives when we search a specific product in a popular web site, and afterwards -in Facebook- will appear other related products. It is not a coincidence; our page will never be divorced from our interests.

In addition, there will be cognitive software's that will motivate interactions between machines. For organizations, the opportunity will be on monetizing proprietary algorithms and offering licenses to non-competing firms. For vendors of technology, they could develop and sale algorithms that help to connect what they are offering today to their customers with other things through them. As a consequence, growth opportunities and advantages in efficiencies will come when inert things will communicate autonomously to do things without human intervention.

The article insists that -in the same way that apps have revolutionized the interaction human-machine- algorithms will be the next quantum leap in the interaction machine-machine, proposing a change in the way we live. A new market to buy and sell algorithms will generate huge profits for the companies that already have them and for a new generation of technological specialized start-ups. Firms will be valued because of their algorithms which convert that data in actions that will impact on consumers, and not for their big data. CEOs will have to concentrate on proprietary algorithms, not only on big data.

In the following Table it is shown a brief summary of this section:

Table 6: The algorithm economy

Area	Description
Information and algorithms.	• Data should be refined and converted into information, that will be the oil of the 21st century. • Algorithms are present in our lives. • Our interests are not divorced from social networks
The opportunity for growth opportunities and efficiencies.	• Monetize proprietary algorithms and offer licenses to non-competing firms. • Develop and sale algorithms. • Helping inert things communicate autonomously to do things without human intervention.
Conclusions	• Algorithms will be the next quantum leap in the interaction machine-machine and will propose a change in the way we live. • Creation of a new algorithm market. • Firms will be valued because of their algorithms.

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5.   WHY WE EDUCATE?

Different authors and specialists state that education is a precondition for progress and evolution of individuals and society. In this sense, Pérez Lindo (2009) is convinced that we educate for growth; for improvement of individuals and society; for collective well-being; to allow individuals and societies have better capacities to communicate and to act cooperatively; and to form intelligent and morally responsible leaders that will ensure the progress of scientific knowledge.

Also, he says that the most advanced societies are the ones that invest more in education, although the extraordinary progress in schooling of populations in emerging countries did not always result in an improvement in social conditions.

With much of coincidence, BC Teachers' Federation (w/d) says that we educate to make a living, to build a better world and maintain positive relationships, to experience a worthwhile life, to live in a sustainable way and care for the environment, to respect diversity and differences, to participate in community and democracy, to be an entrepreneur and/or to be an educated citizen with critical thinking. Additionally and with a similar scope, Perez Lindo suggests that many schools educate for humanistic training, meaning it as a re-education in a broad sense which includes not only learning how to think and how to live together, but also learning to be and to solve problems.

In reference to the objectives and values pursued by schools, different authors are pointing out the materialism, status and standards which are privileged on life quality, community, society and environmental issues. In fact, Abbott and Mac Taggart (2010) critique materialism and acquisition; they are convinced that schools stress status and standards of living rather than life quality or issues that affect all, like environment.

One of their conclusions is that the search for meaning starts young, so children are anxious to make a sense on issues that matter in their own lives. Basically, they are anxious to meet their personal objectives. That is why they are searching for a challenging and stimulating life and to link individual education to community and society, and to create a safe and caring environment.

Speaking on specific values, education may be a bridge to peace and intercultural understanding. In fact, Wharton@Knowledge (2016) refers to Eastern

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Mediterranean International School (EMIS) -located in the city of Ramat HaSharon, in conflict-ridden Israel- that offers the first International Baccalaureate (IB) program to students from all over the world, including Israel and Palestine.

EMIS was established in 2014 after some pilots. Its mission is "to make education a force for peace and sustainability in the Middle East. The school is about teaching values, respecting others, nurturing peace, and making the world a better place". Important things that are taught are tolerance, respect for others and to believe in ourselves.

The students are chosen without regard to gender, race, religion, political or financial background. Focus is on if they are suitable for this program. Some have scholarships and the IB diploma is an entrance to some of the best universities in the world.

Some of the programs refer to conflict -but it is not the main focus as many students are not coming from the conflict area- and bringing together Palestinians and Israelis. Also, programs are connected with knowing and trusting each other.

The team of 20 teachers comes mainly from Israel and Palestine, but a few are from other countries.

EMIS is about a unique experience. There are many extracurricular activities including arts, sports and community service, mostly organized by the students. As an example, the annual Youth Conference on Peace and Sustainability involves other schools of the region (Gaza, West Bank, Jordan and Israel).

As it is at 20 minute drive from Tel Aviv University, every EMIS student has access to university facilities and resources, like library, guidance and lectures.

They are convinced that -through education- peace is possible, and putting everybody together is the solution in the long term. Other partnerships like Seeds of Peace bring together students from areas of conflicts to their campus and then have follow up activities when they come back to their home countries. Actually, more than 6000 Seeds and Educators from 27 countries are working to show that solutions exist and peace is possible.

Students say that EMIS has an important impact on their lives, opening their minds to explore and receiving a better education through student's interaction.

The big challenge that is how to scale this experience, and -for that- it is needed funding that now is coming from the education ministry, tuition fees, private donors and charitable foundations from Switzerland and Chicago. As a result of EMIS's success, two new schools were being analyzed in Israel, one in an Arab region and other in Jerusalem.

Moreover, there are some authors who consider that education is connected to an end (STACK; COULTER; GROSJEAN; MAZAWI; SMITH, 2006; CUBAN, 2003; BURBULES 2004) cited in the BC Teacher's Federation (w/d)), basically to improve the quality of people's life and reflect a wider purpose of education. But on the contrary, certain education systems stress managerial efficiency with focus on processes and structures' tests, diminishing focus on values and stressing "good" (moral nature) over "effective" (managerial effectiveness). Other referred authors (YINGER, 2005; KINCHELOE, 2008) base their work on the importance of education, teaching and learning, focusing on individuals and society' needs linked to life quality which is primarily moral and ethical in a caring society.

Out of different studies, the 21st century shows a dichotomy between specialists who focus on "means" (which propose radical changes on teaching and learning), and others on "ends" (focused on what kind of world we want and help them with the proper education system).

One of Perez Lindo's discouraging conclusions is that last century's history does not allow to see an automatic association between education, progress and collective well-being, but anyway education is an important factor on knowledge and awareness of human being. As a consequence, nothing of what we call culture, society, technical progress or collective welfare would exist without an accumulation of learning of all kinds: moral, scientific, political, social, cultural or spiritual.

Additionally, he argues that knowledge is disseminated in widespread information systems, and virtual education and distance education are making possible the universalization of education. That is the reason why home schooling is a new possibility for many who work or are distant from physical schools.

In his perspective, home schooling and virtual/distance education are not the only issues that are being faced; content is a problem, too. But everything is more complex, and the explosion of scientific knowledge and epistemological criticism

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sometimes lead us to wonder if it makes sense to transmit encyclopedias of knowledge, or whether it is appropriate to emphasize cognitive competencies or the domain of great disciplinary paradigms. As a result, contents that must be taught and pedagogical conceptions -based on intuition and not verified theoretical assumptions- are key components of any educational strategy.

Knittle (2009) reflects on what is the purpose and role of education in society, and on the importance of formal schooling and self-directing learning. The author cites different specialist who have important understandings on education that may be seen as a good summary of the main thoughts presented before, for instance:

- John Dewey: education is connected with social process and growth, but it is not a preparation for life, as is life itself.

  Existing conditions don't allow meeting the needs. As a result, education must be a social center for community daily participation.

- Barack Obama: the fight for social and economic justice begins in the classroom.

- John Ruskin: the objective of education is that people love knowledge (not only learn), enjoy the right things (not merely do the right thing) and love industry (not merely industrious).

- Robert Hutchins: the objective of education is to unsettle minds, widen horizons, inflame intellects, and teach to think straight, not to amuse, and make expert technicians or reform students.

- Horace Mann: to be education a social equalizer, teachers must be inspiring and pupils must have desire to learn.

- Henry Giroux: it is important the capacity of conceptual thought, self-motivation and critical thinking.

- Mass Readiness Final Report: students must be prepared for success in life and work, meeting the needs of workers and public investment.

- Lev Vygotsky: remarks the importance of acquiring abilities for thinking about a variety of things, and not strangle curiosity of enquiry.

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In the following Table, it is shown a summary of this section:

Table 7: Why we educate?

Area	Description
Objectives of education	• Life quality, citizenship, community, society and environmental issues. • Growth, individuals, well-being, capacities; act cooperatively; leadership; scientific knowledge; make a living; build a better world; relationships; live in a sustainable way; diversity; democracy, entrepreneur; critical thinking; learn to be; solve problems. • Dichotomy: "Means" (which propose radical changes on teaching and learning) versus "ends" (focused on what kind of world we want and help them with the proper education system). **• Access to knowledge and enjoying the right things.** **• Unsettle minds, widen horizons, inflame intellects, and teach to think straight.**
Values of education	• "Good" (moral nature) versus "effective" (managerial effectiveness). • Specific values may be put in play as EMIS School, promoting peace and sustainability in the Middle East through a unique experience.
Issues that are being faced	• Home schooling and virtual/distance education. • Content: transmit encyclopedias of knowledge versus emphasize cognitive competencies or disciplinary paradigms. Intuition and not verified theoretical assumptions must be part of the educational strategy. • Existing conditions don't allow meeting the needs. **• Teachers must be inspiring and pupils must have desire to learn.** **• Disclosed conceptual thought, self-motivation, curiosity of enquiry and critical thinking.**
Conclusions	• More investment in education, advanced societies or better schooling don't mean improvement in social conditions. • There is not an automatic association between education, progress and collective well-being. • Education is an important factor on knowledge and awareness of human being. Technical progress or collective welfare exists with an accumulation of learning.

6.   THE IMPORTANCE OF KNOWLEDGE AND SKILLS/ABILITIES

Quantum leaps in competitiveness are not only related to efficiency and processes but to knowledge and its applicability. In this sense, O´Dell (2011) understands knowledge as information put into action, and Schwab (2016) insists that there is a lot of information available put in new uses. As a consequence, Schwab says that big data –that proposes a difference in how society process information and, in time, may also change the way we think- is a transformative technological trend that produces a large body of information and is seriously impacting the way we learn.

Also, says that a large body of information (n=all) is giving the possibility of bigger samples and harnesses as much of the existing data as possible to study different topics. And it doesn't matter if the large amounts of data are messy because they are having more importance than smaller amounts of cleaner data.

Moreover, insists that it was seen a change in the way we know about important things as health or operations; deeper reasons on how the world works are coming from correlation of phenomena and not from causation as we were used. For

instance, failures may be predicted before they happen, replacing the damaged parts and the underlying causes, and health problems may be known in real time by running billions of calculations through searches in Google databases. For these reasons, Francis Bacon understands[3] that knowledge is power, but also that it may add a fundamental competitive advantage in this uncertain new economy.

Out of what it was said before, Knowledge Management (KM) became attractive and useful for the business and academic community as a source of development and future sustainability.

Additionally, CEPAL (2002) distinguishes two types of knowledge: tacit and explicit, as follows:

- Tacit knowledge is unconscious, mechanic, and difficult to be explained and transferred. Oriental cultures, like the Japanese, give more importance to this type of knowledge, giving more confidence to the role of workers.

- Explicit knowledge is conscious and, because it has a structure, it is easier to be shared. The western culture puts its emphasis on this type of knowledge, giving more confidence to the role of executives.

Considering a different perspective on the value of knowledge, countries are seriously impacted by knowledge in their terms of trade as it can be seen in the following example: one ton of soy costs $380.95[4] -very important export commodity for many emerging countries- and an iPad –designed in California, USA, but manufactured in many Asian countries- is priced at $729.99[5], almost doubling the ton of soy.

As it was said, knowledge is important but the skills/abilities that are developed, too. Collins (2016) suggests that new abilities and the capacity to adapt to change are more important than a degree, as follows:

- Changes and technologies are proceeding at high speed, and formal education needs to be updated in order to give better work tools to their students.

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[3] Knowledge is power, from https://www.youtube.com/watch?v=fToVQ6ofo5o, retrieved 12/18/2016.
[4] Bolsa de Comercio de Rosario, from https://www.bcr.com.ar/Pages/Granos/Cotizaciones/chicago.aspx, retrieved 12/18/2016.
[5] Best Buy, from http://www.bestbuy.com/site/apple-9-7-inch-ipad-pro-with-wi-fi-cellular-256gb-at-t-space-gray/5557603.p?skuId=5557603, retrieved 12/18/2016.

- Must be a change from an educational thought of past times to one that may help to understand challenges and how to apply what was learned. It is about the connection between learning objectives and workplaces.

- It is important what was studied for those functions where it is required an enabling degree, but -in other functions- it is fundamental to focus on the necessary skills that are needed to do a good job -in the present but also in the future- in a specific position.

- For many positions, there are required so specific and recent skills that they are not part of any curricula and they are found in the experience of only some people.

- As an important part of strategy implementation, the HR function evolved in the last 40 years from personnel admin, salary payment, legal and files for development and career plans.

- Companies are understanding that business success is connected with age, origin and careers diversity, and that the person is the center of every change.

In the following Table, it is shown a summary of the main concepts that were mentioned before:

Table 8: The importance of knowledge and skills/abilities

Area	Description
Knowledge	• Is information put into action. • There is availability of a lot of information (n=all), put in new uses. • Is power.
Two types of knowledge	• Tacit: unconscious, mechanic, and difficult to be explained and transferred. Important in Oriental cultures, like the Japanese, giving more confidence to the role of workers. • Explicit: conscious, structured and easier to be shared. Important for the western culture, giving more confidence to the role of executives.
Skills/abilities and education	• For some functions, skills/abilities are more important than a degree. • Recent skills/abilities are not in any curricula. • Education must be adapted to give better work tools, and connect learning objectives to the workplace.
Consequences /Conclusions	• Changes the way we think and learn. • Gives the possibility of bigger samples and better studies. • Deeper reasons are coming from correlation of phenomena and not from causation. • Many things may be known in real time. • Adds competitive advantage. • HR function and business schools must evolve to catch up with new circumstances. • The individual is at the center of every change process.

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7.   THE POWER OF EDUCATION-TO-EMPLOYMENT (E2E)

E2E became a key issue for countries and business schools which facing an increasing problematic on youth unemployment and skills/abilities development. Also, organizations are suffering from inadequate content base of their employees, aggravated by deep inconveniences in learning and training.

These areas will be covered in the present section. One of its main conclusions is that solving these inconveniences will carry a better inclusion of more skilled individuals in the corporate and social environments.

7.1.   The problematic of skills/abilities and youth unemployment

It was mentioned before that –for some functions more than others- skills/abilities may be more important than degrees and that new ones are not in any curricula. Following with this idea, IProfesional-Management (2016) indicates that Bill Gates remarks three abilities that will lead to success in the future labor market: science, engineering (specifically math abilities) and economy, and that they are important to understand what it is possible to be done and what not. Finally and after Trump election and for USA, it is expected a duplication of innovation in health, education and energy.

But all these can be considered if youth unemployment is reduced through a better skills/abilities development and more motivating jobs. As a consequence, different EU leaders accept that youth unemployment is one of the most important issues at this time, and -for that- it is fundamental to understand how the people move from the classroom to the workforce and why, and if there are more people looking for jobs it is harder to find the needed skills.

After making a study for the European Union (EU), Mourshed, Patel and Suder (2014) state that:

- It is one of the highest unemployment rates in the world, and that –in 2013- almost a quarter of EU young people were unemployed.

- The economic downturn in 2008 has made worse this issue. One of the main reasons of this inconvenience is the lack of relevant skills to the work place.

- As there is a lack of knowledge coming from the secondary school, economic growth is necessary but not a sufficient condition for improvement.

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- In 2011, the cost of not finding work for these people amounted to 153 billion Euros. There is an additional cost to this jobless generation: earnings 12% to 15% less than their peers at age 42.

- A key issue is not to find a job but to develop skills and career strategies which propose a robust way to development and contribution to firms and society.

- There are three obstacles for the E2E journey which make young people doubt on the benefits of continuing education after secondary school: 1) High costs of post-secondary schools and living, 2) Building the right soft skills (communication, ethics) and hard skills, and 3) Finding the right job – specifically, the worst failure is for young people and small businesses- as there are inadequate support systems to do so.

In an investigation of only three EU countries, IProfesional-Management (2016) refers to a PwC report on young labor inclusion in Switzerland, Germany and Austria. The report concludes that –in OCDE countries- firms and governments may have benefits of more than $1.000 million on gross domestic product (GDP) if they would train their young talents and reduce young people who don't study and don't work. This should be the result of detecting local needs and developing academic programs which may respond to them. In this direction the article also proposes that:

- Every academic plan must be composed of formal knowledge and abilities to intervene in the world in which we live. That is why in this investigation PwC shows how each of the OCDE countries is developing the economic potential of young people and how this performance has changed over time.

- After the global recession and through vocational training and internships, the mentioned three countries could keep youth unemployment low.

- Gaps can be reduced with business training plans, school-company agreements and internships, favoring the inclusion and leveling of young people with lower academic qualifications.

- Modular academic programs -integrating new knowledge and abilities- may respond to the new needs that appear every day and may help in maintaining updated the curricula.

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Just to analyze what is going on in other geographies and agreeing with the previous approach, Bullrich (2016) says that, in emerging countries like Argentina, it is necessary to articulate the corporate and the educational environments if the objective is to be –in 2030- one of the best nations in the world. Insists that with better education it is possible to have better firms and -to achieve that objective- it is necessary to prepare human resources of excellence.

That is why Argentina is working on improving the scheme of professionalizing practices for secondary students: as 90% of the schools in the country only teach 4 hours a day, Bullrich is convinced that it is a good opportunity to make students know the productive projects in each region, adding that the nearer the schools and enterprises will be, the better for the whole society. For that reason, he ends that education is a social achievement.

7.2.   The problematic of learning and training for firms

Learning and training is a hard work for firms. Out of an interview done with Dr. Salas, a Professor of organizational psychology at the University of Central Florida and a Program Director at its Institute for Simulation and Training, Silverman (2012) suggests that -in 2011- U.S. firms spent about $156 billion on employee training but organizations don't rely much on the science of learning and training. The main concepts that came out from that interview are shown in the following paragraphs:

- Generally speaking, companies have a very simplistic view of training. For instance, it is not true that if you send an unskilled employee to training you will have a skilled worker after finishing his/her training.

- It is fundamental to set up the right organizational climate for learning and to apply what was learned. Robeson (2012 b) suggests that many times initiatives are developed at the wrong time (long before they become relevant or when the employees don't need the information).

- There are four basic problems faced in learning and training:
  1. Companies don't take their time to understand their training needs: who needs training and what kind. Robeson (2012 b) complements that the

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contents of those courses not necessarily are what the trainees need and are delivered in the best way to engage them.

2. Organizations do not assess how well employees have learned and a positive reaction to a training doesn´t mean that they learned. So, actual learning and reaction to training show a weak correlation.

3. Technology (mobile app or computer game, for instance) will not solve training problems. There are needed learning objectives, clear feedback, measurements/assessments and opportunities to practice and get feedback.

4. The organization may not be ready for the best training because -when somebody is back to his/her job- there may not be the right supervisory support; the opportunity to practice and/or the conditions to apply the learned skills; and the right motivation to sustain the things that were learned.

- Design is the most important element of a training program; is what somebody does before, during and after it, involving practice, feedback and technology to be used. At this point many specialists recommend a needs and assessment analysis, but Robeson (2012 a) is opposed to this analysis as for a small and medium size firm it is costly, systematic and complex to be followed. He says that intuition is what prevails in these organizations.

- In order to recognize skills decay, supervisors –if they care on the future and are influential on employees- are the ones who should know about needed skills and if some employee should go back to training.

- By the time somebody goes back to his/her job, 90% of the new skills are lost within a year. It is only remmembered 10% of what was learned; being important to reinforce -on practice- what it was learned.

- As it is impossible to memorize everything (information + facts) and -generally- they are needed for the job, companies should put them in databases, manuals and checklists.

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- To motivate workers to focus on training, organizations must engage employees to the idea that learning is a benefit for them as they will be more marketable.

At the implementation stage, Robeson (2012 b) adds that it is not possible to accomplish a large amount of training in short periods of time and that it should be implemented throughout the organization in regards to the trickle-down or ripple impact. The author understands that -in small businesses- the mistake is that they don't train at all; not recognizing that professional development programs keep firms agile and fit, key elements needed to compete and grow.

In the following Table, there are shown the main aspects of this section:

Table 9: Education-to-Employment

Area	Description
Skills/abilities	• The ones that will lead to success: science, engineering and economy.
Youth unemployment	• Must be reduced understanding how and why people move from classroom to workforce. • Main reasons: lack of relevant skills for the workplace and career strategies. • Earnings are reduced for new generations. • Obstacles for E2E (in small businesses these are worst): high costs of post secondary schools and living; building soft and hard skills; and finding the right job. • Benefits of training young people: important increase of GDP. How?: detecting local needs and developing adequate programs, internships, vocational trainings, schools-firms agreements, modular academic programs, integrating productive projects to schools' objectives.
Learning and training for firms	• Organizations don't rely much on the science of learning and training and have a very simplistic view of training. • It is needed to set up the right organizational context for learning and applying what it was learned. • Problems that are faced by organizations: take time to understand training needs; assess how well employees have learned; learning objectives and not technology is needed to solve training problems, and firms may not be ready for the best training. • Key point in learning programs: course design and what is lost after training. **Learning as a benefit and marketability for employees**

8. THE CHANGING CORPORATE EDUCATIONAL LANDSCAPE

Through the last years the corporate educational landscape has changed, showing not only new structures, but also different methods and pedagogical approaches to deliver educational programs. Its final objective is to equip organizations and individuals with better concepts and enhance practices to help business growth in a sustainable way.

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In the following paragraphs, will be detailed some of the newest delivery methods and educational structures observed which offer a better overview of these dramatic changes. It must be clarified that the intention of this section is to propose some understanding on each of the elements that are shown in order to support the point that wants to be addressed, and not to make a deeper analysis on each of them.

8.1.   Changes in educational structures

Out of the traditional HR Training Department, there are many firms -all over the world- that are utilizing other structures like Corporate Universities (CU) and/or expert's corporate training.

8.1.1. Corporate University (CU)[6]

Training and corporate training have been widely accepted as organizations and individuals increasingly needed to understand and implement business topics. New educational proposals -like CU and e-learning- have caused a disruption in the higher educational environment which –in the past- was exclusively populated by Traditional Universities (TU). As a consequence, new roles of institutions, teachers and students were redefined, modifying the educational proposals.

CUs have a wider role –connected with the vision, mission and strategy- than the one that the traditional Training Department (TD) has. That is the reason why more than 3000 CU are functioning worldwide and some experts suggest that -in the near future- their number will exceed that of the TU. In addition, unmet needs and TU swings in different countries and continents made CU a reality in the corporate educational ecosystem. These facts remark the great responsibility that CU has in front of an increasingly demanding student in need of solutions with impact in his/her work.

There are diverse motivations and objectives for CU and TU, and it is proposed a harmonization between them that can cause a major impact on corporate training.

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[6] Further detailed information on CU and for what it is being said in this section may be found in the different publications that are detailed in References on CU.

8.1.2. Experts' corporate training

Through corporate training and based on good research and practices, many professionals and professors -all over the world- are helping organizations to adapt to new conditions and progress in their markets. Some of these experts are worldwide known and others are notable in their local markets.

For example, a worldwide contributor is Professor Gary Hamel, considered by the Wall Street Journal and Fortune magazine as the world's most influential business thinker and expert on business strategy. His books were translated into +20 languages, and some of them selected by Amazon.com as the best business book of the year. Writer of many articles in Harvard Business Review and important journals like Wall Street Journal, Fortune, The Financial Times and many others, he has helped a lot to the business world. As a consultant and educator, he advised corporations like General Electric, P&G, Nestlé, Time Warner, Shell, Best Buy, IBM, 3M and Microsoft, and different government leaders, but his thoughts are applied everywhere (Gary Hamel, w/d).

As a conclusion of this section, it is important -for each firm- to develop the right relation with its environment, to detect the appropriate vehicles to train and improve their organizational posture.

In the following Table, it is shown a summary of the educational structures that were presented in this section:

Table 10: New educational structures

Area		Description
Educational structures	*HR Training Department (TD)*	• Traditional approach.
	Corporate Universities (CU)	• Increasingly demanding student in need of solutions that impact his/her work. •Caused a disruption in the higher education context, and increased number of CU. • New roles of institutions, teachers and students, modifying the educational proposals. • Wider role than TD, connected with the vision, mission and strategy.
	Expert's corporate training	• Worldwide and local experts who help organizations worldwide.

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8.2.   Changes in delivery methods – Distance learning/e-learning

In different regions and countries, the penetration of distant learning/e-learning has increased:

- Hsmglobal.com (w/d, Educación on line en alza) states that –in accordance with a survey performed in January 2011 to 114 universities from Latin America (LA), 70% of them were public and 30% private- the penetration average of e-learning was almost 89%. Also, that 30% was implemented at graduate level, 38% in postgraduate, 27% at extension courses and 5% at other educational levels.

   In Argentina, 73% of these universities preferred b-learning (combination of e-learning and face-to-face classes).

- Hsmglobal.com (w/d, El e-learning se consolida) suggests that -in Spain and out of a study performed to 1000 tech professionals- 97% of them preferred online courses and/or a combination of online and face-to-face courses. It was valued the fact that they don't depend on schedules or other restrictions.

   In addition, more than 50% of the ones that completed any online course were satisfied with it.

   Finally, 90% wanted a course from which they would obtain an official certification that would help to improve their curriculum and increase their value for companies.

But the evolution of e-learning has been faster in the educational than in the corporate sector. In this sense, Robeson (2012, b) suggests that it not possible to ignore the need for training, and that the shift from traditional training strategies (professional conferences, face-to-face sessions and in-services) has been faster in education than in corporate. But anyway, every business looks to the financial results and the corporate arena will make the catch up, if necessary.

Moreover, the author insists that e-learning can help including:

- Relevant content, delivered in the best way the student can learn and need it, considering time and place and assuring better corporate productivity when students prefer not to be seated for long hours in courses and presentations.

- Design online courses –mandated or optional, in anticipation or not- for the variety of learning preferences, with relevant segments and/or complex courses of study. In addition, they may be designed for actual or future purposes or jobs.

- Managers may analyze who is participating, and strengths and weaknesses of the organization to adequately performed future training planning. Also, they can measure the evolution of the different areas affected by training and propose enhancements.

Moreover, Robeson (2012 c) speaks about issues that must be on the attention of executives while implementing e-learning initiatives:

- They are not for the short term or for one-shot. It needs a lot of resources -human and financial- that won't give a reasonable ROI if is not implemented in longer periods of time.

- They don't have the adequate administrative support or commitment to be performed, needing to have many champions –including employees- and not only one that solely struggles against all the organization to make it happen.

- Changing technology often defies the individuals who initiated the project and sometimes they don't have enough preparation to implement next versions or systems that may be applicable. A given example is the migration from Moodle 1.9 to 2.0 which needed a significant manpower conversion that was not available in most organizations.

- Many times funds are pulled from the project and/or costs are underestimated. Typical costs include: servers, switches, bandwidth, electricity, monitoring equipment, software maintenance, technical staff, and security equipment. Also, there are needed to be planned different aspects like: an initial implementation; scan of documents; video conversion and training employees in the learning system; and wages for the ones that create and design the materials, enroll and manage students, and who matches learner's needs with organizational goals.

- Maintenance and updating are fundamental issues for success and continued ROI as some content evolve –vary or become obsolete- while other may remain static.

In addtion and speaking on Learning Management System (LMS), Robeson (2012 d) says that they don't solve every problem, and that their primary objectives are:

- *Control access*: enrollment, payment and authentication from authorized individuals, with the right logins.

- *Provide a structure*: a logical way to allow users to move through learning materials by competences or topic or departments, delivering appropriate content.

- *Tracking and reporting of learning activities*: by courses, individuals, and departments.

A recent development in distance education is the online courses -via web- called Massive Open Online Course (MOOC). Generally, they aim to unlimited participation and open access, while some use closed licenses for course materials and maintain students' free access. Waldrop (2013) suggests that in the freemium business model the course content –basic product- is for free, and what are charged are premium services like certifications or placement. They offer traditional course materials like video recording lectures, problem sets and readings, but many MOOCs add interactive user forums to support the community of students, professors and teaching assistants (TAs). Examples of these kinds of courses are Coursera, Udacity and edX.

In addition and as Onink (2013) suggests, some of them are for-credits like the online master degree that offer Georgia Institute of Technology and Udacity for $7000, 80% less from actual cost of $40,000 for the existing on-campus programs.

8.3. Changes in pedagogical approaches - Flipped school or reverse teaching

Flipped school represents a good example of changes in pedagogical approaches. In "What is a flipped classroom" (w/d) and "Flipped classroom" (w/d), it is said that this pedagogical model transfers some learning processes out of the

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classroom, and uses the time of class and the teacher's experience to facilitate and potentiate other processes of acquisition and practice of knowledge within the classroom.

It implies an integral approach -combining direct instruction with constructivist methods- to increase students' commitment with the course content, improving conceptual understanding through more questioning, discussions and applied activities and exploration which promote the exploration, articulation and application of ideas.

In the traditional model of Education, the homework and the consolidation of what was learned are done after the class, and the teacher's role is the one of the "sage on the stage".

In the flipped school model and before the class, the students receive instructions and assimilate them alone, and during the class the students do activities to improve the learning process, and the teacher supports that learning. In this case, the teacher's role is to "guide on the side".

Advantages of flipped classrooms are: 1) that the teacher focus primarily on student's learning individual needs, 2) more time dedicated to diversity, 3) possibility of sharing information and knowledge, 4) access/re-access to better content, and 5) creates a collaborative learning context.

In the following Table, it is suggested a summary of what was described in this section:

Table 11: Changes in delivery methods and pedagogical approaches

Area		Description
Delivery methods	*Distance learning/e-learning*	• Increased popularity in different regions. B-learning is preferred, too. • Don't depend on schedules or other restrictions. • Good customer satisfaction. • Certifications are required to increase the individual value for companies. • Faster evolution in the educational sector than in the corporate sector. • Some benefits: relevant content at student's need, course design, and better educational analysis. • Implementation recommendations: not short term or one-shot, commitment, admin support, resources should evolve with technologies, adequate assignment of costs and funds, and importance of maintenance and updating. • LMS: access, structure, tracking and reporting. • MOOC: unlimited participation and open access. May have freemium business model.
Pedagogical approaches	*Flipped schools*	• Some learning processes are taken out of the classroom, and time of class and teacher's experience are used to facilitate and potentiate the learning process and practices. • Teacher's role: "guide on the side". • Benefits: diversity, individual learning, knowledge sharing, collaborating context, access/re-access to content.

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9.   CONCLUSIONS

The unlimited is a borderless territory where the whole world pertains. It covers and applies to society, human being, science, and business; and the whole planet and its structures. It is the domain of the blurred in a global environment composed also by industrial sectors, organizations, processes, and activities; and education –specifically, corporate education- is not an exception.

In the following paragraphs, there are shown the fundamental findings of this study.

9.1.   Big problems need technology and automation replies

Big problems –like economic exclusion, feeding shortages and educational access- can be tackled by visionary thinkers and cheap technology and new utilization of existing advances. It presents huge challenges with new students, teachers and organizations.

Fresh tools and novel ways of thinking and doing are being required to solve existing problems. In this sense, disruptive educational structures, novel delivery methods and advanced pedagogical approaches are invading the corporate education landscape. Their objective is to achieve an effective learning and applications on what was learned.

Technology is affecting areas as operations and infrastructure, but -in addition- the classroom. If it is used in the right way, it is a differentiator for firms, and also an amplifier or enabler of people's potential. Also, it has the capability to transform many industries and work. Agriculture and industry were impacted by technology, and services and white collars are about to happen. Obviously, corporate education is being affected, too.

By the way, automation is forcing the development of a new mindset: the "learn it all/ connected-caring-willing to try and fail-wanting to learn", needed to be successful in the volatile environment where we live. Many actual jobs are increasingly replaced, and humans must be called to do better and more skilled jobs. But as algorithms are doing more skilled jobs (like the board of directors), a danger exists for many more jobs, and –for sure- for low value added positions and works.

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As people become smarter through their connection with technology and its application to reality, and intelligence and analytics will be democratized and distributed through customized dashboards, man-machine work will increasingly change and evolve. As a consequence, human's job should be directed to the translation and interpretation of data, to recommend a course of action and to redirect algorithms to new levels of knowledge, being ready to intervene while avoiding unwanted situations.

In this sense, people will be empowered through a scaled technology at an affordable price; will need to adapt in what they do, believe and think; and do what machines still cannot do (have inspiration and a human brain), or think by their own.

Definitely, the world will change in an unpredictable way with Machine Learning (ML) and more intelligent people.

Moreover, the fourth revolution we are going through is about combining innovation and technologies, blurring the lines of the physical, digital and biological spheres. It will not only change what we are doing, but it will change us.

The technological trends that are driving this revolution are basically AI, 3D printing, IoT, robotics, synthetic biology, big data, quantum computing, social media, autonomous vehicles, nanotechnology, biotechnology, energy storage, and entrepreneurial innovation in the developing world.

It is suggested that the beneficiaries of this innovation wave will be the providers of intellectual and physical capital. For instance and as algorithms will be the next quantum leap in the interaction machine-machine proposing a change in the way we live, to monetize proprietary algorithms it would be useful that universities participate with the acquired knowledge and in the creation of a new algorithm market.

Nobody knows where technologies will finish; the future is uncertain. Human-machine intelligence is a continuous learning process, which is more difficult because of the volume and complexity of big data. As new technologies (like VR) are being applied to new fields (like music) and there are new combinations of technology which are transforming the product consumption and its experience, it is not possible to predict the future curve of progress, for instance, on corporate education.

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In this context, success is connected with being an open minded (not "control oriented" mindset); reviewing what and why something is being done; and transforming mistakes in learning. There are not assured stones to walk on when we are in the presence of the unlimited.

9.2. Leadership and organizations must be transformed

Organizations –in search of the perfect mix between humans and technologies- must be agile, focused on customers and work in teams, but with less human intervention. As a consequence and as productivity is a top management responsibility, leaders should distinguish when to implement physical or knowledge automation, identify the areas for automation and prioritize processes and activities to be transformed.

Finally, the role of the leader is to give a human touch to daily operations; treat adequately exceptional circumstances and do what machines cannot (ask good questions, evaluate information and interpret results).

9.3. Understanding change through knowledge and skills/abilities generation

Knowledge is information put into action, and power, too. Everyday, it is expanding our contact with reality and our understanding of phenomena.

Although for organizational growth and evolution, tacit and explicit knowledge must be adequately managed; it does not provide sufficient coordinates in relation to its future evolution. But knowledge is not enough as, for some functions, skills/abilities –basically, on science, engineering and economy- are more important than a degree.

Additionally, change and evolution disclose the need of new skills/abilities which are not in any curricula. That is the reason why education must be oriented to giving better work tools, and connect learning objectives to the workplace.

As a result, changes should be introduced in the way we think and learn, and work on the gap between what we were taught to think and what we should be thinking.

Moreover, knowledge and skills/abilities will probably change as bigger samples and better studies are carried on, finding deeper reasons on actual phenomena.

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Concluding with this section, there are -at least- two visible consequences that must be remarked: 1) for organizations, to be successful it is fundamental to understand change, generating consistently new knowledge and skills/abilities, and disseminating them throughout the whole organization in order to be converted into novel technologies and products/services, and 2) for universities and business schools, a different perspective on knowledge generation and application should be developed in order to help organizational growth and sustainability all over the world. Universities are knowledge reservoirs that must be put at the service of firms and individuals, enhancing their possibilities. In conclusion, organizations, universities and business schools must be prepared to have and utilize the needed knowledge in real time to add competitive advantage.

9.4.   Education and training need a rethought

As automation progresses, new boundaries will be reached in the educational context, although the classroom is still seen as the domain of the professor because teaching depends on a deep expertise and profound interaction.

In addition, education is an important factor on knowledge and awareness of human being. So, it has diverse objectives connected with the society, the environment and the individual. It means access to knowledge to many more people, enjoying the right things, unsettling minds, expanding horizons, inflaming intellects, and developing thought straight.

But still, there are dichotomies on why we educate ("means" or "ends") and on values ("good" or effective") that should be left aside, integrating benefits and diminishing inconveniences in order to help growth, a balanced life quality and social condition.

A key issue is how to make teachers to be more inspiring, and pupils have more desire to learn, and to be self-motivated to inquiring and to critical thinking. It is needed a new education and training perspective in order to change the whole context, specifically on new delivery of contents; interdisciplinary majors in different institutions; different courses' length; online material, redesigning homework and quizzes; specialized certification programs and a mentor's perspective for professors.

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Also, the online education –which offers specialization, customization and convenience-, is taking its path as digital natives increase in number.

With hybrid programs and multi-modal classes, memorization is giving its place to knowledge application, transforming teaching from student-centered to outcome-based.

9.5.   The importance of Education-to-Employment (E2E)

Youth unemployment is important for growth and GDP increase, and may be reduced if it is understood how and why people move from classroom to the workforce. It is noted a lack of relevant skills for the workplace and appropriate career strategies, and -for new generations- earnings will be reduced if obstacles for E2E are not removed.

To expand possibilities, it is necessary to detect local needs in order to develop adequate programs, internships, vocational trainings, schools-firms agreements, and modular academic programs, integrating productive projects to schools' objectives.

Additionally, employees should observe learning as a benefit and as better marketability. To do that, organizations should rely much more on learning and training, setting up the right organizational environment to apply what was learned.

There are some challenges on E2E which imply resolving some problems that are faced by organizations, like taking the right time to understand training needs; assess how well employees have learned; establish adequate learning objectives, and try to balance the needs of firms with the training that is being offered. Also, improving course design and what is lost after training.

Finally, lifelong learning is a worker's responsibility, not company anymore, in order to assure that what is being learned is in connection with present and future desires and possibilities.

9.6.   New educational structures, delivery methods and pedagogical approaches

The HR traditional Training Department (TD) is giving way to new educational structures -like CU and expert's corporate training- as increasingly demanding students and organizations are in search of learning programs that may distinguish

them from a myriad of others who compete for the same positions and in the same markets. In this ambience, institutions, teachers and students are developing new roles, being required new educational proposals.

Also, new delivery methods -like distance learning/e-learning (DL) - and new pedagogical approaches –as flipped schools- are taking their place. It is noted that b-learning is increasingly being preferred.

Benefits are shown in DL because it doesn't depend on schedules or other restrictions, showing good customer satisfaction. It should be approached as a long-term initiative, providing admin support, resources and maintenance. In some programs, certifications are required.

Also, LMS provides an adequate structure for accessing, tracking and reporting, and MOOCs –offering unlimited participation and open access- may have a freemium business model.

In addition, flipped schools offer a new learning process with activities that are taken out of the classroom and a different way of using time and teacher's experience. As a result, the teacher's role becomes a "guide on the side" more than "the sage on the stage". This pedagogical approach offers benefits as better individual learning, knowledge sharing, a collaborating environment and access/re-access to content.

In this study, it was shown that the unlimited is present in education, and specifically in the corporate educational arena. Helped by technology and automation, disruptive leaders are challenging the way things are done, the way we think and, also, what we are.

It is imperative to transform organizations and leadership, to understand change through knowledge and skills/abilities generation, to rethink education and training, and to take E2E as a serious matter by governments, organizations and individuals.

In addition, new educational structures, delivery methods and pedagogical approaches should be considered in this borderless and uncertain environment.

As the future is hardly unknown the best thing is to shape it in our minds. To do that, there are necessary to be asked the following questions:

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- *Are we making the right questions?*

- *Are we adequately looking at the present in order to know something in the future?*

- *Are we envisioning the needed leadership for the future?*

When talking about development –education is a case-, everything is about the question that we pose, not the replies that we give.

REFERENCES

ABBOTT, J.; MAC TAGGART, H. (2010) **Overschooled but undereducated**, Continuum International Publishing Group, NY: USA.

BC TEACHERS' FEDERATION (W/D) **Why do we educate?**, from http://bctf.ca/uploadedFiles/Public/Issues/21CL/WhyDoWeEducateFeb26.pdf, retrieved 01/09/2017.

BELLUCCI, M. (2014) **Advierten que en los próximos 20 años van a desaparecer más de 700 trabajos, Clarín.com**, from http://www.clarin.com/sociedad/trabajos-advertencia-estudio_0_rkpSwP5wQe.html, retrieved 12/27/2016.

BULLRICH, E. (2016) **Esteban Bullrich en la UIA**: "Debemos articular más el mundo empresarial y el sistema educativo", Infobae, from http://www.infobae.com/politica/2016/11/22/esteban-bullrich-en-la-uia-debemos-articular-mas-el-mundo-empresarial-y-el-sistema-educativo/, retrieved 12/27/2016.

CEPAL (2002) **Introducción a la gestión del conocimientos aplicada al sector público**, from http://www.cepal.org/publicaciones/xml/7/12167/manual22.pdf, retrieved 12/18/2016.

CHUI, M.; MANYIKA, J.; MIREMADI, M. (2016) **Where machines could replace humans and where they can't (yet), McKinsey Quarterly**, from http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet, retrieved 12/23/2016.

COLLINS, A. (2016) **Las nuevas habilidades y la capacidad de adaptarse al cambio pesan más que el título académico**, *iProfesional-Management*, from http://www.iprofesional.com/notas/242998-Las-nuevas-habilidades-y-la-capacidad-de-adaptarse-al-cambio-pesan-ms-que-el-ttulo-acadmico, retrieved 12/21/2016.

DEWHURST, M.; WILLMOTT, P. (2014) **Manager and machine: the new leadership equation**, *McKinsey Quarterly*, from http://www.mckinsey.com/global-themes/leadership/manager-and-machine, retrieved 12/19/2016.

DIARIO LA VOZ (2016) **El 35% de los empleos desaparecerá en 20 años por reemplazo de las máquinas**, from http://www.lavoz.com.ar/tecnologia/el-35-de-los-empleos-desaparecera-en-20-anos-por-reemplazo-de-las-maquinas, retrieved 12/27/2016.

FLIPPED CLASSROOMS (W/D), from https://www.knewton.com/infographics/flipped-classroom/, retrieved 01/05/2017.

FLORIDI, L. (2014) **What is the Fourth Revolution?**, from
https://www.youtube.com/watch?v=JGUCOCsSTAE, retrieved 12/25/2016.

GLENN, M. (2008) **The future of higher education: How technology will shape learning, Economist Intelligent Unit**, from https://www.nmc.org/pdf/Future-of-Higher-Ed-(NMC).pdf, retrieved 01/08/2017.

GROTHAUS, M. (07/06/2015) **Los trabajos de 2025: qué profesiones van a ser protagonistas en diez años**, Diario La Nación-Economía, from
http://www.lanacion.com.ar/1807608-los-trabajos-de-2025-que-profesiones-van-a-ser-protagonistas-en-diez-anos, retrieved 12/27/2016.

HAMEL, G. (W/D) **It's time to reinvent management, you can help, Management innovation eXchange**, from http://www.managementexchange.com/users/ghamel, retrieved 01/05/2017.

HSMGLOBAL.COM (W/D) **Educación online en alza**, from
file:///C:/Users/.%C2%B4%C2%BF/Desktop/Universidad%20Temas%20-%20soporte/Educaci%C3%B3n/60607-educacion-online-alza.htm, retrieved 12/19/2016.

HSMGLOBAL.COM (W/D) **El e-learning se consolida**, from
file:///C:/Users/.%C2%B4%C2%BF/Desktop/Universidad%20Temas%20-%20soporte/Educaci%C3%B3n/60831-el-e-learning-se-consolida.htm, retrieved 12/19/2016.

IPROFESIONAL-MANAGEMENT (2016) **Bill Gates revela tres habilidades esenciales para el éxito en el mercado laboral**, from
http://www.iprofesional.com/notas/243547-Bill-Gates-revela-tres-habilidades-esenciales-para-el-xito-en-el-mercado-laboral, retrieved 12/28/2016.

IPROFESIONAL-MANAGEMENT (2016b) **Capacitar a los jóvenes NI-NI podría mejorar el PBI de los países de la OCDE en U$S1000 millones**, from
http://www.iprofesional.com/notas/242297-Capacitar-a-los-jvenes-Ni-Ni-podra-mejorar-el-PBI-de-los-pases-de-la-OCDE-en-us1000-millones, retrieved 12/29/2016.

IPROFESIONAL-RECREO (2016) **Averigua si un robot te quitará el trabajo de aquí a cinco años**, from http://www.iprofesional.com/notas/242852-Averigua-si-un-robot-te-quitar-el-trabajo-de-aqu-a-cinco-aos, retrieved 12/21/2016.

KNITTLE, B. (2009) **Why do we educate?**, from
http://www.bethknittle.net/WP_Blog/?p=731, retrieved 01/09/2017.

MERCADO-TECNOLOGÍA (2016) **Un futuro intimidante en cinco grandes temas**, from http://www.mercado.com.ar/notas/tecnologa-%7C/8020952/un-futuro-intimidante-en-cinco-grandes-temas, retrieved 12/31/2016.

MOURSHED, M.; PATEL, J.; SUDER K. (2014) **Education to employment: getting Europe's youth into work**, McKinsey Center for government, from
file:///C:/Users/.%C2%B4%C2%BF/Downloads/Education%20to%20employment%20Getting%20Europes%20youth%20into%20work%20full%20report.pdf, retrieved 12/20/2016.

O´DELL, H. C. (2011) **The New Edge in Knowledge**, United States of America: John Wiley & Sons, Inc., Hoboken.

1056

ONINK, T. (2013) **Georgia Tech, Udacity shock higher with $7,000 degree, Forbes**, from http://www.forbes.com/sites/troyonink/2013/05/15/georgia-tech-udacity-shock-higher-ed-with-7000-degree/#baeae397e895, retrieved 01/05/2016.

PÉREZ LINDO, A. (2009) **¿Para qué educamos hoy?**, from http://www.augustoperezlindo.com.ar/docs/educacion/para%20que%20educamos%20hoy.pdf, retrieved 01/02/2017.

PYLE, D.; SAN JOSE, C. (2015) **An executive's guide to machine learning**, McKinsey Quarterly, from http://www.mckinsey.com/industries/high-tech/our-insights/an-executives-guide-to-machine-learning, retrieved 12/19/2016.

ROBESON, K. (2012a) **Issues with corporate training**: Part 1 – The five W's and the H, from http://elearningexperts.net/issues-with-corporate-training-part-1-the-five-ws-and-the-h/, retrieved 12/25/2016.

ROBESON, K. (2012b) **Issues with Corporate Training**: Part 2 – How Can E-Learning Help?, from http://elearningexperts.net/issues-with-corporate-training-part-2-how-can-e-learning-help/, retrieved 12/26/2016.

ROBESON, K. (2012c) **Issues with Corporate Training**: Part 3 – Where are the Black Holes?, from https://elearningexperts.wordpress.com/2012/10/08/issues-with-corporate-training-part-3-where-are-the-black-holes/, retrieved 12/26/2016.

ROBESON, K. (2012d) **Issues with Corporate Training: Part 4 – Learning Management Systems and Business. A Good Fit?**, from https://elearningexperts.wordpress.com/2012/11/19/issues-with-corporatetraining-part-4-learning-management-systems-and-business-a-good-fit/, retrieved 12/26/2016.

SILLVERMAN, R. E. (2012), **So much training, so little to show for it**, The Wall Street Journal, from http://www.wsj.com/articles/SB10001424052970204425904578072950518558328, retrieved 12/18/2016.

SCHWAB, D. K. (2016) **The fourth industrial revolution**, The World Economic Forum, Genève: Switzerland.

THE FOURTH INDUSTRIAL REVOLUTION - DOCUMENTRY (2016), from https://www.youtube.com/watch?v=kpW9JcWxKq0, retrieved 12/23/2014.

TRAUTMAN, Y. (2016) **La realidad virtual entra en la música**, Diario La Nación, Vida & Ocio-Tecnología, from http://www.lanacion.com.ar/1967345-la-realidad-virtual-entra-en-la-musica, retrieved 12/21/2016.

VAMOS, S. (2016) **Digital Disruption is a human thing, TED x Melbourne, Australia**, from https://www.youtube.com/watch?v=lQUt-EKwa94, retrieved 12/25/2016.

WALDROP, M. M. (2013) **Massive Open Online Courses, aka MOOCs, Transform Higher Education and Science**, *Nature magazine*, *Scientific American, from* https://www.scientificamerican.com/article/massive-open-online-courses-transform-higher-education-and-science/, retrieved 01/05/2017.

WHARTON@KNOWLEDGE (2016) **Education beyond Borders**: Fostering Peace and Understanding in the Middle East, from http://knowledge.wharton.upenn.edu/article/education-beyond-borders-fostering-peace-understanding-middle-east/, retrieved 12/29/2016.

WHAT IS A FLIPPED CLASSROOM? (W/D), from http://www.theflippedclassroom.es/what-is-innovacion-educativa/, retrieved 01/05/2017.

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