Get ready for the skills economy

Learn, Act, Share

Collection of Insight Papers

Presented at the G20 Young Entrepreneurs' Alliance Summit
20-21 September, 2018
in Buenos Aires, Argentina

Entrepreneurship, Education and the Businesses of the Future

G20 Young Entrepreneurs' Alliance

G20 Young Entrepreneurs' Alliance Summit Argentina 2018

Table of **contents**

Get ready for the skills economy

Learn, Act, Share

Foreword by Alejandro Finocchiaro,

Minister of Education, Culture, Science and Technology, Republic of Argentina

It is a great honor and responsibility for the Ministry of Education of the Argentine Republic to promote, for the first time in the history of the G20, an education agenda that continues building the consensus necessary for global development. This is a historic moment when education is, undoubtedly, the main factor for the sustainable development of Nations. At present, natural resources are no longer the key to envisaging a prosperous future, which is now based on the creation of knowledge. Because it is through knowledge that our youth are included and provided with the tools necessary to build their own future successfully.

The G20 Education Working Group held various meetings which prioritized skill development, with a lifelong learning approach, as well as the financing of education, which must be both sufficient and efficient to ensure not only system sustainability, but also the building of an international architecture for financing education in a robust and complementary manner.

We are facing an ever-changing world where new technologies are modifying the way in which we relate, study and work. That is the scenario for which we must prepare children, youth and adults; those are the challenges of the 21st century.

An inclusive society can only be possible through a sustainable development agenda, which places education as a fundamental part of the mechanism for our children and youth to follow the path of knowledge. Accordingly, a change of paradigm is vital for education to continue performing this key role in society. We need to rely on the most powerful tool in order to foster opportunities, develop people's full potential and build an active citizenship.

That is why the Argentine Government has prioritized the design of an education system aimed at responding to the transformations that students, teachers and school authorities face today.

We have to think about how and what children and youth are learning, as the upcoming world needs a citizenship trained in skills of the future. Therefore, Argentina has adopted a policy intended to transform its education system through Secundaria 2030 (Secondary School 2030). Its main goal is to ensure that all students complete secondary education mastering areas of basic learning so as to pursue their life projects and contribute as citizens to the development of a more just, equitable and democratic society. This commitment leads to a profound renewal of the institutional and pedagogical organization of secondary education in order to give specific and relevant answers to the new challenges posed by the world, as well as to provide students with the knowledge, skills and values necessary to be part of a society affected by the exponential development of new technologies, science and the evolution of new jobs.

We have also developed Aprender Conectados (Learn Connected), a comprehensive innovation policy implementing digital education, programming and robotics from early childhood education to the end of secondary school.

Many of the children who now fill our classrooms will certainly perform tasks and occupy spaces that we cannot even imagine today. They must be ready for jobs that do not exist yet. Consequently, not only do we promote a better transition from school to the world of work, but we also foster entrepreneurship, a key tool to renew education at national and global levels, helping students develop skills, abilities and instruments so that they can be trained as independent, innovative and creative agents for economic and social development. Moreover, it involves adopting a more pragmatic view within a society demanding performance of the individual, not only from a corporate standpoint, but also on the basis of skills and competencies that allow her/him to face challenges, assume risks and meet with both success and failure, as well as learning opportunities.

We need to ensure that coming generations learn and understand our globally shared values. I am pleased about the declarations and recommendations agreed and the consensus reached nowadays in order to nourish, guide and join us in the challenge of creating the best conditions for the human, productive, cultural and economic development of each and every one of us. The commitment and participation of the youth are priceless for meeting these global challenges. Integrating and working together make us stronger.

Foreword by Bruno Sanguinetti

G20 YEA President for Argentina

The Alliance of Young Entrepreneurs of the G20 (G20 YEA) is an organization of all G20 countries that promotes youth entrepreneurship for economic renewal, job creation, innovation and social change; It has represented approximately 500,000 young entrepreneurs.

Each year, the G20 YEA brings together the best young entrepreneurs in the world to share their ideas with the B20 and G20 leaders to catalyze global change.

This year, the G20 YEA is celebrated in Buenos Aires, Argentina, on September 20 and 21. Taking advantage of the success of our previous communities in Germany, Canada, France, Mexico, Russia, Australia, Turkey and China, we focused on organizing a summit with and for young entrepreneurs from around the world under the theme «Quality education for future business» .

Small and medium enterprises, and young entrepreneurs, continue to be at global level the driving force of innovation, growth and employment in the G20 economies. Being that two thirds of the workforce of the private sector are employed and represent 80 percent of the net growth of employment in the G20. And with the rapid emergence of the digital economy, barriers to entry are shrinking, encouraging many more people to start their businesses.

To specifically contribute to the policy dialogue of the G20 2018, young entrepreneurs at the 2017 YEA G20 Summit in Berlin voted in its three main priority areas for a more in-depth study and recommendation: quality education, international mobility and smart taxes.

Since the Summit, the G20 YEA has led three working groups in charge of creating position papers and additional recommendations for B20 and G20 leaders in each priority area.

This year, CAME Joven, in Argentina present the theme: “Education, Entrepreneurship, and the Future of Business”. Education is today, a fundamental pillar to create successful business. The future of those businesses is based in creation of new solutions, to problems that might not yet appeared.

The quality education is a theme very broad, and the development of them is what will allow us to become the drivers of the future we want to build.

I.a

From the 3rd industrial revolution to the knowledge economy

by Grégoire Sentilhes

President and Co-founder of Nextstage, Citizen Entrepreneur and G20 YEA France

A. One of the best definitions, of intelligence characterizing and differentiating the human species, with respect to all other living species, is unquestionably the ability of man to adapt over time.

1. At the time of the homo sapiens they characterized this ability to adapt - to survive nomadically as «hunter-gatherer» - within a radius of 50-100 km as the differentiating element of the human species with regard to the evolution of other living species This period has undoubtedly been one of the periods when the human species has shown the greatest «intelligence» by its ability to adapt to other living species, many of which have since disappeared (dinosaurs, tyrannosaurs, mammoths ...), precisely because it could not adapt to the evolution of the environment.

2.The Neolithic Agricultural Revolution 10,000 - 2,500 BC, characterized by the transition of tribes from «hunter-gatherers» to agriculture and settlement", the first industrial revolution 1450-1850, and the second industrial revolution of 1850- 1995. These three events inevitably entail both an increasing taylorisation of tasks (agricultural, industrial, service) and also a growing settlement of the population in particular, marked by an unprecedented population growth, 1 billion inhabitants in 1900-7.5 billion in 2015- 9 billion in 2050 and amplified by a phenomenon of concentration through a galloping urbanization and the explosion of the number of cities greater than 10 million inhabitants since 1970.

"This economy of the 3rd industrial revolution and the knowledge economy challenges the traditional organization of the economic value chain and thus all the actors that are part of it."

3.The combination of the increasing Taylorism of agricultural and then industrial production, the production of services and the acceleration of urbanization have progressively reduced the capacity for initiative and thus adaptation of man (disconnection from the evolution of the environment settlement, increased dependence and assistance, reduction of the capacity of too many individuals to be sufficiently autonomous, reduction of the sense of responsibility and increase of a form of social egoism ...) and therefore our individual and collective capacity to face and adapt to the new challenges created by the emergence of the 3rd industrial revolution.

B. The 3rd industrial revolution has spread rapidly since 1995 on a global scale and is structured around 3 convergent phenomena:

1. The rapid explosion of «human» internet (0 users in 1990, 1 billion fixed internet users in 2010, 6 billion mobile internet in 2017) and the Internet of Things (40 billion internet of things in 2020) , the exponential progression of the computing power of microprocessors, modeled by the Moore's law, by the acceleration of the information transfer speed 22 kbps in 1990 to 10 gigabits for the 5 G, and 1 petabit on the optical fiber, and the pursuit of increasing the level of security of information transport on networks (in 1995 Internet, in 2015 Blockchain), and the exploitation of the volume of data: 2.5 exabytes of data created every day, or in other words, humanity now produces more information every three months than it has created since the beginning of humanity. This deeply impacts the functioning, the social organization as the evolution of individuals as businesses and nations.

2. The energy revolution, traditional (oil, natural gas, electricity...) which, like information, progressively goes from «centrally produced analog product" to «de-materialized and decentralized service» where each becomes progressively able to consume, produce, store, and share energy through smart grids as we do now with information over the internet.

3 . The emergence of a new added-value chain of the economy organized no longer vertically and sectorally as at the time of the 2nd industrial revolution (primary: agriculture and mining activities, secondary: industrial activities, tertiary: service activity) but so transversal and horizontal around
a) economy of the value of our emotions and the quality of the customer experience, b) "on demand" economy and sharing around the digital platforms which allowed to emerge what is now the 7 global companies in terms of market capitalization (Apple, Google, Microsoft, Amazon, Facebook, Alibaba, Tencent), c) industrial internet or industry 4.0 and where most of the wealth created comes less from the products themselves than from value added upstream (with robots) and downstream (with the Internet of Things and artificial intelligence).

This economy of the 3rd industrial revolution and the knowledge economy challenges the traditional organization of the economic value chain and thus all the actors that are part of it.

Concerning the big companies from the 2nd industrial revolution: EY estimates that 75% of Standard & Poor's companies will have disappeared from the rankings within 30 years, because they have not adapted to give way to more agile and innovative players.

The gradual "uberisation" of the role of States, too big, too heavy, too short term oriented, on indebtedness and engorged in heavy decision-making processes where social bodies defend their acquired advantages, remain insensitive to the urgency of change and the need to adapt, and too often leaving the nationalist preference prevail (United States, Italy, Germany, Hungary, ...) or authoritarian systems become the rule (China, Russia, Singapore, ...) because better they slowly emerge more able to manage the requirements of the long term transformation.

C. This third industrial revolution brings out the knowledge economy where the new gold is the extraordinary mass of information produced, the «big data» and the ability to extract value through "data mining" and artificial intelligence to transform it into knowledge.

The key to the success of this evolution, which determines our individual and collective future, is the human capital which is our most precious asset in the field of education which knows a triple revolution:

1. The education of the youngest age until the end of studies is transmitted less and less from an «top down» approach with a "knower ", the teacher and a "learner", the student. It consists more in a transversal process in the form sharing of experience guided or not by a teacher. In this respect, the innovation introduced in the field of

education by the Ecole 42, founded by Xavier Niel, now one of the best developers in the world, without a teacher, constitutes an extraordinary kick in the anthill / upheaval of in a world of education that is not naturally focused on innovation and agility. In the 21st century, learning to code is perhaps more important for our children than learning foreign language.

2. Training throughout working life is no longer an option, but essential both for the employability of individuals and also for their ability to perform their work in an effective, relevant and exciting way. How a 55-year-old doctor who has finished his studies for thirty years can continue to treat cancers without integrating for his patients the new possibilities offered by immunotherapy? How can a worker on a production line be efficient if he has not been trained to learn how to manage robots that transform the organization of his work into tasks with much higher added value? How can a high official or a politician claim to exercise responsibilities in the service of the citizens, if he does not understand himself the springs of this new economy that has so much economic and organizational impact. Vocational training today is both key and totally changing in nature. From an occasional and exclusive presence, vocational training becomes more and more digital through MOOCs, increasingly social transversal because learning is an experience that makes sense when it is shared, and even more interactive and personalized because everyone between us learns differently: this is the issue of intelligent learning systems.

3. Investing in human capital through education and vocational training becomes the key to the success and the transformation capacity of large companies, cities and states alike. Singapore has reinvented itself with extraordinary success for 50 years as a « knowledge city « in the sense that the historian Fernand Braudel defined it because it has become a «smart city». Schneider Electric in the field of electricity or LVMH and Kering in the field of luxury, or DBS, one of the largest banks in Asia, have reinvented themselves by investing heavily in innovation and human capital training. Because one and the other are now inseparable, as the success of innovation is linked and determined by the fact that all employees of the company adheres, understands and becomes the engine of transformation.

"Both individuals and businesses or cities and states must become learners, agile."

Both individuals and businesses or cities and states must become learners, agile. Capable to transform to position himself in an economy where the forms of organizations are radically transformed and different where each individual becomes again «entrepreneur of his destiny» and «hunter-gatherer», as well as individual and collective actor of this irresistible process of "creative destruction" perfectly described by Joseph Aloys Schumpeter in 1911.

Conclusion

And as an old Senegalese African proverb says, full of wisdom, «there is no love if there is no understanding and there is no understanding if there is no learning".
In the knowledge economy, as in Sapiens' time «Man is nothing in himself, he is only an infinite chance, but he is the infinite responsible for this chance». Albert Camus

I.b

Address employability challenges by building a learning culture

by Alain Roumilhac & Jean-Marc Tassetto

President ManpowerGroup France / Co-Founder Coorpacademy

In a few years, job boards will be full of roles for things like self-driving car engineer, blockchain developer, growth hacker - none of which were job roles that existed even five years ago. As the *World Economic Forum's 2016 Future of Jobs report* and the *OECD* among many sober analyses of the future have warned us, as Artificial Intelligence (AI) and robotics move into our workplaces jobs have to change - and with it, the skills we need to remain relevant. Indeed, as few as 35% of current skills will still be relevant in five years, and soft skill-intensive occupations will account for two-thirds of all jobs by 2030 (*World Economic Forum* and *Deloitte*, respectively).

As a result of these seismic drivers of employment change it is becoming more and more imperative everybody be prepared to think about his or her long-term employability. In parallel, businesses that don't equip their workforces with the tools they need to survive will not be able to stay at current level, shrinking or even disappearing as disruptive new players take over.

On the plus side, with a strengthening global economy employers are more optimistic about hiring, yet emerging technology and changing skills needs are leaving employers with unfilled roles, threatening productivity, efficiency and future growth. These combined factors have pushed talent shortages to their highest level since 2006, with more employers than ever struggling to fill open jobs – 45% globally say they can't find the skills they need, a ratio up from 40% in 2017 and the highest in over a decade (findings from the *Manpower 2018 Talent Shortage Survey*).

Clearly, we are living a skills revolution, where new skills emerge as fast as others become obsolete. In such a context, the question of what skills and talents will be in greatest demand in our future economies simply has to be addressed. The Manpower survey, for example, highlights that near 30% of employers find that applicants lack the ideal in either hard or soft skills, which makes it harder to build an effective team with the appropriate skill mix. As a result, transferable soft skills are gaining greater importance, with (in the same research) more than half of employers saying communication skills – written and verbal – are their most valued soft skills, followed by collaboration and problem solving.

"Given how fast jobs are changing, a solid diversified workforce is less about what people already know than about their capacity to learn."

Given how fast jobs are changing, a solid diversified workforce is less about what people

More than half of companies say communication skills, written and verbal, are their most valued soft skill followed by collaboration and problem-solving.

Source: ManpowerGroup, Skills Revolution 2.0
https://www.manpowergroup.co.uk/wp-content/uploads/2018/01/MG_WEF_SkillsRevolution_2.0_paper_lo.pdf

already know than about their capacity to learn and its development potential. So where can we expect change to be greatest? The WEF Future of Jobs report gives us some suggestive ideas. Creativity is allegedly one of the top three skills workers will need, and also while robots may help us get to where we want to be faster, they cannot as yet be as creative as humans. Emotional intelligence, which did not feature in the top 10 in the 2015 report has nonetheless become one of the top skills needed by all, while complex problem solving is now rated as the number 1 skill for 2020.

How will we learn or re-acquire these crucial capabilities? Lifelong learning is vital to society and businesses, but how to create the best, most supportive learning culture to encourage it? Organizations need to accelerate their efforts to upskill and reskill employees – but they also need to say goodbye to long, boring e-learning sessions that are too general to be personalized and really engaging to today's learner. The good news is that change is coming. A new generation of digital tools are plugging the gap. Global analysts Gartner have stepped in to identify the most salient characteristics of the change. In a *May 2018 Market Guidance note*, Gartner's Jeff Freyermuth has identified a new phenomenon, the Learning Experience Platform (LEP), which he states places the learner's experience at the top.

How? By personalizing the learning journey first, offering employees the content they really need. Constant upskilling is something very personal and closely related to our daily job activities; to be successful, a modern workplace learning experience should be well integrated with a job position and be directly useful. Microlearning is a very powerful way to make this happen and should be well integrated into the learning experience, allowing the employees to directly look for the knowledge they need before a meeting, for example. Gartner's analysis spotlights also the importance of reflecting the reality of how people learn, with training content always available remotely, increasingly via mobile, and at the learner's convenience, as well as proven engagement techniques such as video and gamification; neuroscience has shown us that playing stimulates curiosity and the desire to progress.

"Neuroscience has shown us that playing stimulates curiosity and the desire to progress."

At the same time, the contribution of the community of learners should not be underestimated either. The ability to interact and measure up to others increases learning capacities, which are stimulated, among other things, by the analysis of one's environment and anticipating actions in the game. This has been well demonstrated by cognitive science researcher Daphné Bavelier from the University of Geneva, who writes on why "playing action-based games allows the player's brain to develop better models of the world and to do it faster".

Play or interactive experiences modernize first generation e-learning by creating a playful and congenial learning experience. When corporate learning platforms are appropriately designed to take full advantage of this salient fact, interestingly, the percentage of learners who engage in "battles" (as on the *Coorpacademy platform*, for instance) can reach 85%, something that we think suggests that gaming speaks to everyone. It has also been observed that learners are more engaged and efficient than their non-playing peers. Meanwhile Coorpacademy platform clients report that learners who play will easily watch twice as many videos as non-players and make it through three times more chapters, for instance.

However, a learning culture cannot be built without data. It is absolutely essential for an organization to get closer to its learners so it can test and learn from them (see article by J. Dehler Zufferey and F. Benichou in this collection). Introducing an analytics-driven learning approach will help companies to be more agile and improve the learning experience – always with the same objective in mind, to re- and up-skill the workforce, at speed, and at scale.

In conclusion, here in the midst of the 4th Industrial Revolution, the future looks more and more uncertain. What we do know for sure: some jobs will disappear, some will be replaced by AI or robots, some will be created. In this dynamic context, business survival requires deeper and more diverse skills sets, while the importance of soft skills is rising because some hard skills have not been invented yet. The verdict's clear: brands must build and nurture a continuous learning culture now to allow their teams to thrive, adapt, and build the future together.

I.c

Reskilling at scale

by Céline Laurenceau & Julien Fanon

Managing Director, Accenture Strategy / Senior Manager, Accenture Strategy

"The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn" explained the American prospectivist Alvin Toffler. An observation shared by companies interviewed by Accenture, all of which are facing disruptions and feel they need to be more agile. An observation shared by employees themselves, as most of the employees surveyed by Accenture, expressed the willingness to acquire new skills.

While the skills obsolescence is estimated at 5 years against 30 years in 1985, leaders must redefine the roles of employees, shift the workforce to new business models and most importantly scale-up "New Skilling" programs. Last but not least, a social challenge also explains the urgent need to reskill employees: ensure that a significant portion of the workforce is not left behind when it comes to new ways of working and new technology.

"The skills obsolescence is estimated at 5 years against 30 years in 1985."

"New Skilling" programs must be rapid, flexible, tailored and large-scale.

Accenture developed a New Skilling program to rapidly pivot over 160,000 of its employees to be proficient in new IT skills. The program is based on a progression of skills from awareness to expert. It is based on a suite of innovative learning methods grounded in neuroscience research. Methods are combined in a multichannel approach to foster continuous learning: Job Shadowing, Augmented Reality simulations, Hackathons, Peer-to-Peer Learning...

Expanding the reach of skills programs is a 3 steps approach.

The first step is to prioritize skills for development. Regarding new technologies, the most valuable human skill required to collaborate with AI is the judgment skill, which is much needed to intervene and make decisions when machines struggle to make them. This requires knowing how they categorize information and understanding the parameters of their algorithms. A sustained success will also depend on practicing Responsible AI, ensuring that data and systems are managed to be fair, transparent and accountable. This will require training programs that extend from regulatory imperatives to the ethical behaviors of people and machines.

The second step consists in tailoring programs to suit a range of employee "starting points." Companies need to determine the

willingness to learn and skills levels of their own workforce to adapt "New Skilling" training efforts accordingly.

The last step aims at leveraging digital to create innovative learning experiences. Digital learning methods, such as virtual and augmented reality technologies, can provide realistic simulations to help workers master new manual tasks with smart machinery. The same technologies can help reinforce correct procedures on the shop floor by monitoring and coaching how employees execute tasks. At Walmart, for example, US employees are being trained at the retailer's training academies using Oculus Rift virtual reality headsets. This allows trainees to experience and practice responding to real-world scenarios, as they watch remotely through the employees' eyes.

"Skills that will matter the most tomorrow need to be identified today by corporate decision makers: given your corporate strategy, market trends and technology disruptions, what are the skills likely to emerge?"

What's needed is an urgent shift in learning approaches. Skills that will matter the most tomorrow need to be identified today by corporate decision makers: given your corporate strategy, market trends and technology disruptions, what are the skills likely to emerge? Conversely, what are the skills that slowly phase out – as you will need to reskill employees accordingly. How do you reskill at scale? And how do you keep the learning process a continuous journey?

References:

« Reworking the Revolution »,
Accenture, 2018
https://www.accenture.com/us-en/company-reworking-the-revolution-future-workforce

I.d

Starting young: learning entrepreneurship

by Lamia Kamal-Chaoui

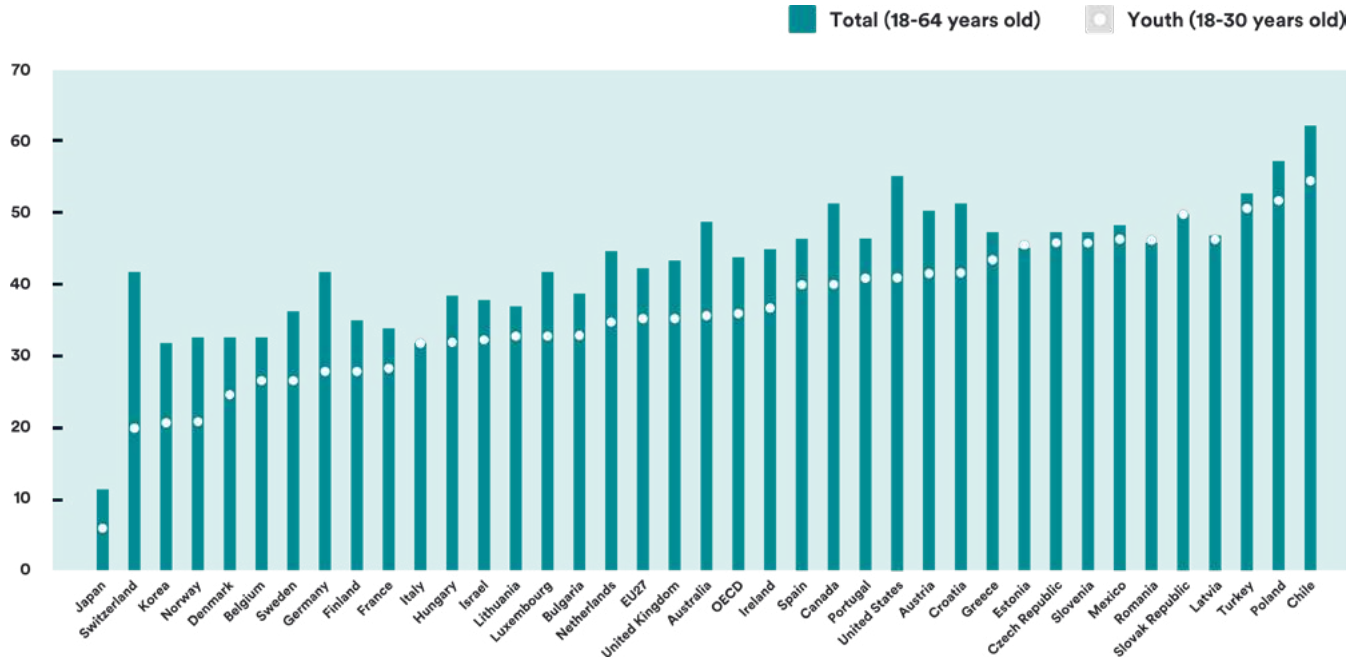
Director, Centre for Entrepreneurship, SMEs, Regions and Cities, OECD

Youth are entrepreneurial! New business creation data across OECD countries for 2012-2016 show that 18-30 year olds were more likely to be working on setting up a new business than their older counterparts (6.6% versus 6.1%), more likely to be setting up businesses in teams of 3 or more, and had a new business ownership rate matching that of adults of over 30 years old (3.5%) (OECD/EU, 2017).

However, young people face numerous barriers to entrepreneurship, often over and above those faced by their older peers – in identifying opportunities, accessing financing, developing networks, and managing teams. They also often hesitate to start for fear of failure or because they lack the skills (Figure 1). Entrepreneurship education can be a critical support in helping youth to develop an entrepreneurial spirit and obtain the skills needed to become successful entrepreneurs. It is a high-return investment.

Entrepreneurship skills are a greater barrier to business creation for youth

Percentage of population who responded "yes" to the question:
"Do you have the knowledge and skills to start a business?", *Data from 2012-16*



Notes: See Figure 3.13 in OECD/EU (2017). Source: OECD/EU (2017) using special tabulations of the 2012-16 adult population surveys from the Global Entrepreneurship Monitor (2017).

Efforts are increasing to build entrepreneurship competencies through formal education …

Courses and other supports to build entrepreneurship skills in schools, vocational education and training providers, and higher education institutions have become increasingly common in the last decade. They focus on issues of perception about the desirability and feasibility of the entrepreneurial action – either as an entrepreneur or an entrepreneurial employee – and developing the ability to cope with failure.

"Young people face numerous barriers to entrepreneurship, often over and above those faced by their older peers – in identifying opportunities, accessing financing, developing networks, and managing teams."

However, educational science shows us that developing certain attitudes, knowledge and skills is more effective if started with early intervention (Cunha and Heckman, 2010). In the area of entrepreneurship skills, a change of content, pedagogy, learning outcomes and assessment strategies can be introduced as the student progresses, with a gradual increase in the extent that a start-up orientation is offered (OECD, 2015). Some countries (e.g. the United States, Ireland, and Denmark) have already introduced such a progressive approach, but in most OECD countries there is still a need for more entrepreneurship education activities at lower levels of education (GEM, 2017).

Spotlight on higher education

Higher education institutions (HEIs) can be great generators of entrepreneurial individuals. To do so, they themselves need to adopt entrepreneurial approaches to entrepreneurship teaching and supporting graduates who are motivated to start up new ventures — particularly with half of young people accessing higher education across the OECD area. According to the Global University Entrepreneurial Spirit Students' Survey across 50 countries in 2016, 8% of students intended to start a business right after graduation and 30% considered this a likely career option five years after graduation. The OECD and European Commission have developed the HEInnovate guiding framework for HEIs in this area (www.heinnovate.eu). It identifies many good practices, such as giving students the possibility to document the entrepreneurship competencies they have developed in their studies and extracurricular activities, for example with diploma supplements or other certificates.

What are key areas for government action?

Develop a progressive approach at each stage of the education process. Educational curricula and systems should lay the foundations of an entrepreneurial mind-set at early stages of learning.

Support for teachers. Effective entrepreneurship education requires adequate preparation time for teachers, tailored education material, and guidelines that facilitate the collaboration with external partners (OECD, 2015). In many countries, teacher networks have been formed to provide peer support (e.g. the U.S. Network for Teaching Entrepreneurship, NFTE).

Closing gaps in start-up support. Start-up support should be provided for students who are motivated and able to start a business in the near future. This can be facilitated by creating close connections between education institutions and local business support organisations. Furthermore, higher education students should be supported to combine studies and start-up efforts, for example by receiving a special status similar to sport champions.

References:

Cunha F. and J. J. Heckman (2010), "Investing in Our Young People", in Reynolds, A. J. et al., (eds.), Childhood programs and practices in the first decade of life, Cambridge University Press, New York, 381-414.

GEM (2017), Global Entrepreneurship Monitor Report 2016/2017, published online, *www.gemconsortium.org*.

OECD (2015), From Creativity to Initiative: Building Entrepreneurial Competencies in Schools. A Guidance Note for Policy Makers, published online, *http://www.oecd.org/site/entrepreneurship360/blog/guidancenote-policymakers.html*

OECD/EU (2017), The Missing Entrepreneurs 2017: Policies for Inclusive Entrepreneurship, OECD Publishing, Paris, *https://doi.org/10.1787/9789264283602-en*.

II.a

Welcome to the Experience Era

by Madhu Vazirani & Francis Hintermann

Principal Director, Accenture Research / Global Managing Director, Accenture Research

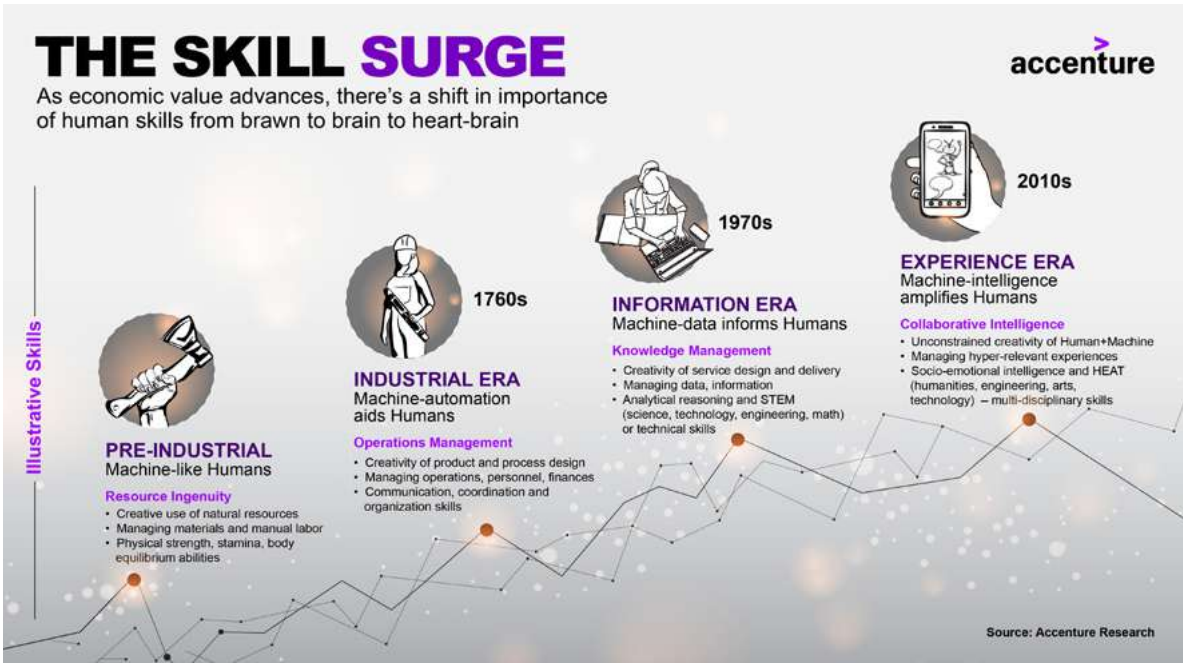
Companies are no longer in the business of selling just products and services—they are now selling ***experiences*** as well. Welcome to the Experience Era, where consumers want hyper-efficient, hyper-connected, and hyper-personalized experiences all the time.

The good news is, with new technologies and Artificial Intelligence-based systems shifting customer journeys and expectations, organizations can now engage with their customers in more relevant ways than before. But with this new era also comes a major workforce challenge.

Unlike the Information Era, which put a premium on STEM (Science, Technology, Engineering, and Math) skills, the Experience Era demands much more from companies and employees: STEM and HEAT (Humanities, Engineering, Arts, and Technology) skills. While the Information Era required legions of smart engineers to build our digital world—platforms, networks, and algorithms—the Experience Era will also require people trained in the arts and humanities—"soft"-skilled creatives to make sense of all that data generated by AI. For instance, Autodesk relies on a multi-disciplinary team to make its customer-support virtual assistant, AVA, more human and emotionally intelligent. The team includes not only software engineers and data scientists but also user experience designers, creative writers, and communication and customer-behavioral managers who design personas, shape linguistic patterns, and improve the user experience. To be sure, the coders and engineers will be just as important (after all, we still need technical skills to design new AI systems and take science and technology to greater heights), but people with humanities and arts degrees will be crucial players in the innovation space.

"While the Information Era required legions of smart engineers to build our digital world, the Experience Era will also require people trained in the arts and humanities - "Soft"-skilled creatives to make sense of all that data generated by AI."

How so? Their social and emotional intelligences can help develop a new understanding of customer needs and create new customer experiences. They can provide unique perspectives on social culture, and design things like user interfaces. Their conscience and self-discipline can keep companies ethical and human-centric in their use of Responsible AI. And they can engage deeply and meaningfully with customers when needed.



Take, for example, the case of Walmart's online-grocery shopping service, which includes a local pickup option. Employees had to learn how to work with Walmart's digital app, apply their judgment and decision-making to prepare orders and make item substitutes when necessary, as well as socialize face to face with shoppers. A more complex role than that of a cashier.

"Talent has a lot more to do with persistence and adaptability than a coding language," said Jeremy King, executive vice president and chief technology officer for Walmart US and eCommerce.

Workers everywhere must learn new skills, and be willing to adapt to keep pace with technological change. To succeed in this Experience Era, employees and companies must also be willing to abandon old ways of thinking about what our brains can learn.

Neuroscience, for example, is challenging conventional notions that our brains cannot be changed after the formative years of age 20 or so. In fact, recent studies on neuroplasticity have discovered that our brains, including the "social brain," keep changing in both structure and function. Their findings suggest that higher levels of socio-emotional intelligence, including empathy and moral intelligence, can be developed with the right mental training at any age.

That raises several important questions: How should companies invest in training programs for this new age? How should leaders embrace neuroscientific techniques to accelerate the brain's learning capacities? And how should digital technologies, such as virtual reality, be used to enhance experiential learning?

Provocative questions indeed—questions that Accenture will seek to answer in a report set to publish this year. One thing is for certain in the interim, though: When customers turn up the heat on companies to deliver more relevant experiences, those companies must turn up the HEAT to prepare their people to deliver on those expectations.

II.b

Corporate Training Is Dead... Long Live Corporate Training!

by Arnauld Mitre

Co-Founder Coorpacademy

Like all industries based on the transmission of content, since the advent of the Web the corporate training sector is in the midst of major structural change.

Remember what happened to movies and TV: once, it was possible to buy or rent a DVD shortly after a movie theatre screening, or to wait for it to be aired on television, a rhythm the consumer was very happy to accept. But illegal pirate websites caused the first ripple of change. Apart from giving access to content for free, they highlighted the customer's desire to have instant access to an infinite catalogue of content. In response, quick-witted companies like Apple (with iTunes) reinvented their business model to include payment for each acquisition, helped by a qualitative user experience. Netflix changed the landscape even further by offering a non-binding monthly subscription to a huge amount of content, much of it exclusive.

This power shift from the distributor of content to the consumer of that content – who now decides the "what", "when" and "how" of its consumption – is also happening in the world of vocational training. MOOCs (Massive Online Open Courses) and their models of 24x7 free access to a global knowledge database are just the first step of this revolution, and their advent needs to be carefully understood in the corporate training world.

Why? Because MOOCs show the organisation's head of training that it is unrealistic to try to control topics employees want or need to be trained in. After all, in their hands they have a magic wand, their smartphone, that allows them to access anything, wherever and whenever they want.

"Customers desire to have instant access to an infinite catalogue of content."

Let's take a deeper look in what the Netflix model teaches us. People usually think about the User Experience, when it comes to Netflix. Yes, it is paramount in the way that it respects the plurality of individuals. An individual can have various needs, and be at different parts of his/her life: the Netflix model will respect this plurality with an ultra-personalized recommendation engine. It will adapt to your mood, the time of day, and suggests you content according to what it thinks would be the best for you to watch. Still respecting the plurality of people's needs, Netflix has a "search bar": sometimes, you want to look for a particular content, and not to have content submitted to you. Netflix will respect this plurality of needs. Another example is the films covers: they change according to the person and his/her viewing history. Someone who likes thrillers will be shown more action-oriented

covers on the platform, even on a romantic comedy! This User Experience has to be kept really simple for the viewer, and everything is thought for him or her to have the best possible experience, whatever his or her needs are. It illustrates the principle of simplexity: something very complex, hidden in lines of code and artificial intelligence programs making the most simple and easy-to-use experience to the end-user. A very complicated container (on the inside) making everything easy (on the outside) and respecting people needs.

Apart from the User Experience, another very important aspect of the Netflix model - both aspects couldn't work separately - is the content with a double dimension. A premium dimension, and an infinite one. The premium content will make people subscribe, will make them come on the platform. The impression of infinity and catalogue depth will make them stay on the platform and keep their subscription going.

Both work together: an impeccable UX with infinite content, a simplex container for a deep content catalogue, and cannot be taken apart. In the case of MOOCs, it has also to adapt to the plurality of learners' needs. If it's good to have an efficient recommendation engine, learners can have different needs and search for particular courses on a given period: digital learning platforms must respect learners' different needs while offering a vast content catalogue.

We're already deep in the next step of this revolution – the centralisation of infinite learning content in one platform, in parallel to what Netflix offers. Why is infinite problematic? Because it has a major inherent flaw: you get lost pretty quickly. A friend told me a few years ago that he had 2 million songs on his iPod, and as a result he didn't know what to listen to anymore ! From this flaw arises the necessity for a guide – a place where you can find recommendations of properly curated content to allow the learner to accrue the most benefits from the vast size of a catalogue.

"Both work together: an impeccable UX with infinite content, a simplex container for a deep content catalogue."

Opponents of these wide-open catalogues and marketplaces will tell you that this system brings a loss of control, and risks the lowering of overall content quality. But that ignores the inescapable fact that these platforms have allowed the rise of talented people that wouldn't have broken through if they had had to wait to be selected by omnipotent broadcasters (think YouTube stars like Justin Bieber, and all the fresh content coming out of Amazon Studios).

Many smart Learning & Development (L&D) leaders are starting to hear the mood music here, opening up to innovative solutions – frequently from nimble EdTech (Education Technology) startups. Corporate training is dead, long live corporate training!

Original content

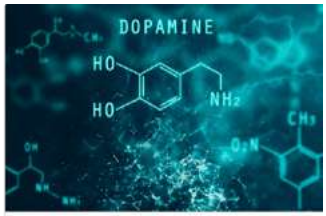
Premium and infinite content

Future of skills

It starts with soft skills

Simplexity

Personalized but simple user experience



Dopamine

Gamified learning environment and community of learners

II.c

From the bank of a changing world to the young generations who change it

by Jean-Laurent Bonnafé

Director and CEO, BNP Paribas

BNP Paribas is proud to be a partner of the G20-Youth Summit. As one of the largest European banks, active in 73 countries, we provide the means to make ideas and ideals become realities. We believe in the collective intelligence and the individual talents of today's youth. They are already changing the shape of the world, coming up with ideas that no one would have ever imagined. They are the ones who invent new ways of leading. They consider racial and gender equality of utmost importance – and as CEO of BNP Paribas this is an issue I am especially committed to, with all our employees.

Representing today's finest young executives, the Youth Summit participants have the commitment, the energy and the creativity our world needs. But above all, they have a vision. Many people believe that the youth of today has lost a sense of reality. At BNP Paribas, we don't. We think that their vision is more realistic than that of previous generations. Because they know that there is no viable future if together we don't solve the biggest issues facing our planet. That is why today's youth doesn't look for a career, but for commitment. Bringing meaning and the means to make it effective is our responsibility at BNP Paribas. And we are proud to have been the first to conclude partnerships with Social Business initiatives, two decades ago, when it was looked upon as youthful eccentricity.

"We believe in the collective intelligence and the individual talents of today's youth."

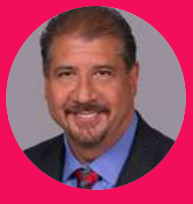
We are convinced that big companies have a responsibility because their actions affect the world as much as the choices from governments and politicians do. For this reason, BNP Paribas launched, last year, its Company Engagement department. Reaching out to all young people, our commitment is two-fold. We contribute to integrating young people struggling to find their place in society, through various initiatives, ranging from volunteering to social grants. We also provide the impulse that brings energy to the projects of young entrepreneurs and leaders, who hold the future in their hands and hearts.

As open as it seems today, the world is often closed to young talents. With global instability, some investors and employers are reluctant to take risks. Too many young people do not have enough access to what they need in order to put their ideas into action and to reach their full potential. Young entrepreneurs need training, tools and contacts. They need the financing that gets a business started, and the long-time partnership that fosters ambitious projects. This is why at BNP-Paribas we offer young talents a unique alliance.

We trust the young generation to lead the future in the right direction. And they can trust our dedication to providing them with the means to change the world. At BNP Paribas, we provide the stuff dreams are made of, made real and lasting.

II.d

Wondering if Your Education is Worth the Cost? Businesses Can Help



by Mark Weinberger

Global Chairman and CEO, EY

Education costs are rising, just as businesses require a range of new skillsets – from data analytics to artificial intelligence and robotics. For students, this creates real concern about whether their education is preparing them for a rapidly changing economy.

In the face of these pressures, it's time for universities to adapt – to ensure that students and businesses feel confident that a college education offers the right skills for the future of work.

Businesses can help by partnering with universities to better prepare students. Here are three ways to do so.

Developing Common Credentials

Today, there hundreds of thousands of degrees, certifications, and other credentials available to students and workers. But in this sea of credentials – all of which rely on different criteria – it can be difficult for businesses to understand which skills a potential hire actually has.

This is why a number of leading business and higher education groups have come together to launch the first-ever national registry of workforce credentials, Credential Engine.

Systems like this make it possible for universities and businesses to establish common definitions for credentials. That way, businesses will have verifiable ways to evaluate applicants' qualifications – and students will have a clear sense of the real-world value of their education.

Creating Courses Together

Businesses and universities can also work to design courses that ensure graduates have the chance to learn skills that are most in-demand.

At EY, we've worked with educators to create a free, virtual library of curriculum modules on a variety of topics – including analytics mindset, audit, and drone inventory. In addition, we've built a version of our audit analytics tool for students, giving them a unique opportunity to learn on a real tool that we use.

This year we've also teamed up with Udemy to offer all 250,000 of our people unlimited, free on-demand learning libraries and massive open online courses or MOOCs from some of the world's leading experts. The breadth of subjects is vast, ranging from learning to code from scratch to mastering the fundamentals of data visualization and from IT and marketing to leadership and personal well-being.

By partnering with businesses to create and offer courses like these, universities can help ensure their students are ready for the future of work.

Applying Skills to the Real World

Getting credentials and courses right goes a long way toward making education worth the cost, but there is one more thing students need: real-world experience. Here, too, businesses can partner with universities.

"In a time of rapid disruption and uncertainty, it's understandable that many young people are questioning the value of their education. But businesses and academic institutions also have more ways than ever to ensure those students have the skills they need."

Northeastern University, for example, has a co-op program allowing students to switch between semesters of classroom learning and semesters of full-time jobs backed by academic credit. Similarly, at EY, we ensure that our 10,000 interns worldwide are treated as real members of the team, and get practical experience to help them succeed.

In a time of rapid disruption and uncertainty, it's understandable that many young people are questioning the value of their education. But businesses and academic institutions also have more ways than ever to ensure those students have the skills they need. We all have a stake in getting this right – and, together, we can change the future of education for the better.

II.e

Leveraging the potential of behavioural learning analytics

by Jessica Dehler Zufferey, & Frédérick Benichou

Head of R&D, Coorpacademy / Co-Founder, Coorpacademy

When digital learning was still called 'e-learning', learning analytics did not yet exist. That was partly because Data was not yet 'Big', but mainly because any learning data that was harvested following the face-to-face classroom training model. Learning Management Systems (LMSs) managed access and tracked participation of learners, so in this perspective clearly data was equal to the attendee list. And as LMSs were also really designed for trainers who would upload content and create tasks for learners, the next bit of data was the number of content downloads and task completions. Finally, embedded monitoring tools informed trainers and administrators about who finished training modules successfully, so that data indicated module completion as performance indicator.

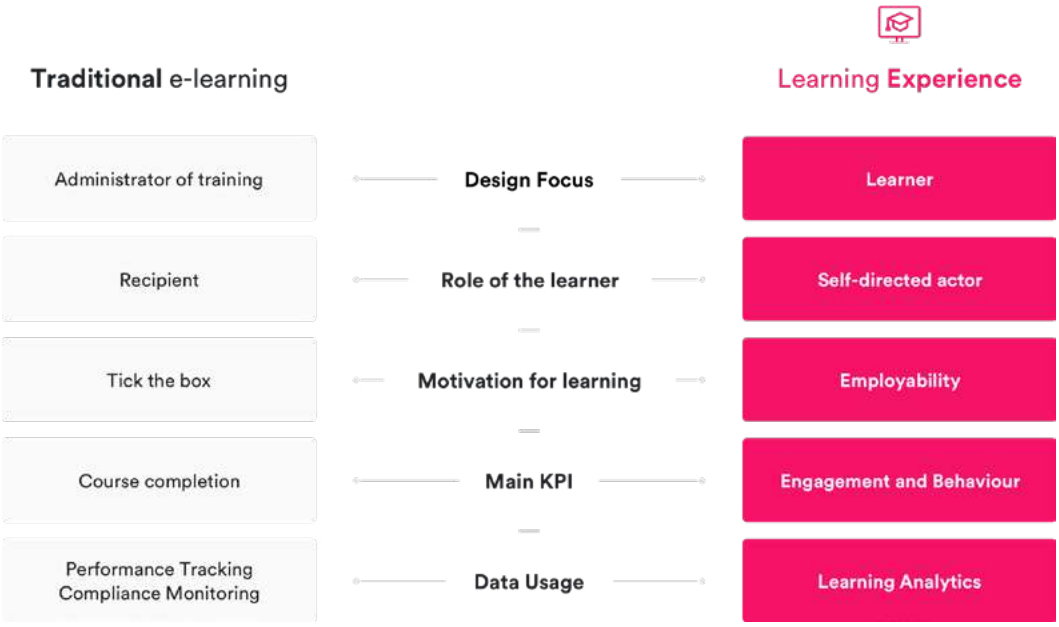
Given the methodology underpinning this kind of data model, it can't be a surprise that any insights and conclusions that were possible on the basis of this data were not really that new or exciting. The good news is that those days are over, and much more flexible and interesting ways of working with corporate learning have started to deliver much richer datasets that can be the basis for really useful work.

The Dawn Of The Learning Experience Platform

When new players and entrepreneurs entered the Learning & Development content and software market a few years ago and applied the logic of digital first, agile, and user-centric, the LMS and its outmoded data approach suddenly started to look embarrassingly inadequate. New-style Learning Experience Platforms (LEPs), as recently formalized as a new market category by *Gartner*, exemplify this shift from an administrator-centric to a truly learner-centric design, both in terms of delivery model and usability discipline.

"The data we're getting back now is much more complete and behavioral."

The follow-on for learning analytics: the data we're getting back now is much more complete and behavioral. That's because, in order to constantly improve the learning experience, LEPs track any behavior traces and use them to test what works and what doesn't, based on new ways of collecting data such as the *xAPI*, which tracks the stream of learning activities and not just completions of modules.



The impact is twofold: One, the learner is increasingly viewed as the recipient of data-based insights, not the administrator or course convener. This is more than welcome, as the learner, not just the trainer and administrator, should be aware of what her own data says about her progress and experience. After all, if we want our team members to be truly autonomous learners who are able to ensure their own long-term employability, why would we not provide them with access to their data from digital learning environments?

Secondly, trainers and administrators also benefit. That's because they can access all sorts of new types of insight – not only what someone successfully learnt, but also how the learner got there and which learning approach they chose. This opens up tremendous diagnostic value, way beyond pure learning analytics. Take an analogy from the game industry: special predictive recruiting games (e.g. *https://www.knack.it/*) are used there to identify a set of performance indicators, identified as crucial for job performance based on analyses of successful previous employee performance, with the game score determining the candidate's match with the job profile. Apply that idea to LEPs, and 'behavior' in a job-related but appropriately gamified online training would be an even more valuable source of information about suitability for a crucial position.

In response, we propose to create new performance indicators that reflect those behavioral qualities. Take curiosity: a valuable HR metric, as it has been identified as an "important variable for the prediction and explanation of work-related behavior" (Mussel, 2013), and motivation to engage in lifelong learning is crucial for today's adult in order to keep their employability high. Another important effect of curious collaborators is that they contribute to a company's innovation potential, particularly in the light of the "death of top-down management" (cf. John Bell, 2013). Given the ever-increasing stress on employability in modern life and business culture, then, we can thus presume curiosity will become an even more desirable indicator to try and measure.

Perseverance is a second example. As researcher Angela Duckworth (see her *TED talk*) found when studying resilience, persons sustaining interest and effort over a longer period of time are reaching higher performance levels than persons with low 'grit' or personal resilience. There is a clear value for companies to consider perseverance: when you next need to decide who to recruit/promote/propose to lead an ambitious project, or who to develop through training, expect to soon start looking for not just the most qualified but also the most resilient candidate available (cf. Amy Ahearn, 2017). Companies, and more specifically HR leadership teams, can therefore clearly benefit from information about the perseverance levels of their learner population.

The transformative potential of these new indicators is even greater if you consider that the World Economic Forum identified re- and up-skilling of the current workforce as the number one strategy companies embrace when facing the changes our current Industrial Revolution is inaugurating. If we want to integrate the learner and employee journey to enable both the corporation and the learner/employee/citizen to do this, HR professionals should use multiple, but appropriate, data sources to properly consider the full candidate potential of a person for a specific job not only in terms of their knowledge and skills, but also their character and behavioral qualities, too.

"In order to fully exploit the potential of behavioral data, it is necessary to reconsider the indicators that we monitor such that they not only cover the result of learning but also the approach of learners."

Wrapping our argument up, we see that learning analytics became more behavioral with the arrival of the new generation of platforms that are focused on the learner experience. In order to fully exploit the potential of behavioral data, it is necessary to reconsider the indicators that we monitor such that they not only cover the result of learning but also the approach of learners. These new "Behavioral Learning Analytics" will put learning and training back in the center of the challenge of employability.

References:

Mussel, P. (2013) Introducing the construct curiosity for predicting job performance. Journal of Organizational Behaviour 34(4) 453-472.

Bell, J. (2013): How Vital is Curiosity Within the Workforce? *https://www.linkedin.com/pulse/20130708112524-5008753-how-vital-is-curiosity-within-the-workforce/*

Ahearn, A. (2017): The Flip Side of Abysmal MOOC Completion Rates? Discovering the Most Tenacious Learners, edsurge, 2017. *https://www.edsurge.com/news/2017-02-22-the-flip-side-of-abysmal-mooc-completion-rates-discovering-the-most-tenacious-learners*

III.a

Research for Education Policy and Improvement: A Tripartite Collaboration In Singapore

by Chee Kit Looi & Longkai Wu

Professor / Scientist at Nanyang Technological University, Singapore

Singapore is a small city state in South East Asia with an internationally acclaimed education system. The students have been the top performers in the OECD PISA tests for science, math, literacy and collaborative problem solving for the year of assessment 2015. Yet, the education authorities there have continued to aspire to move towards education policies, reforms and cultural practices that can nurture creativity, innovation and entrepreneurship from the students.

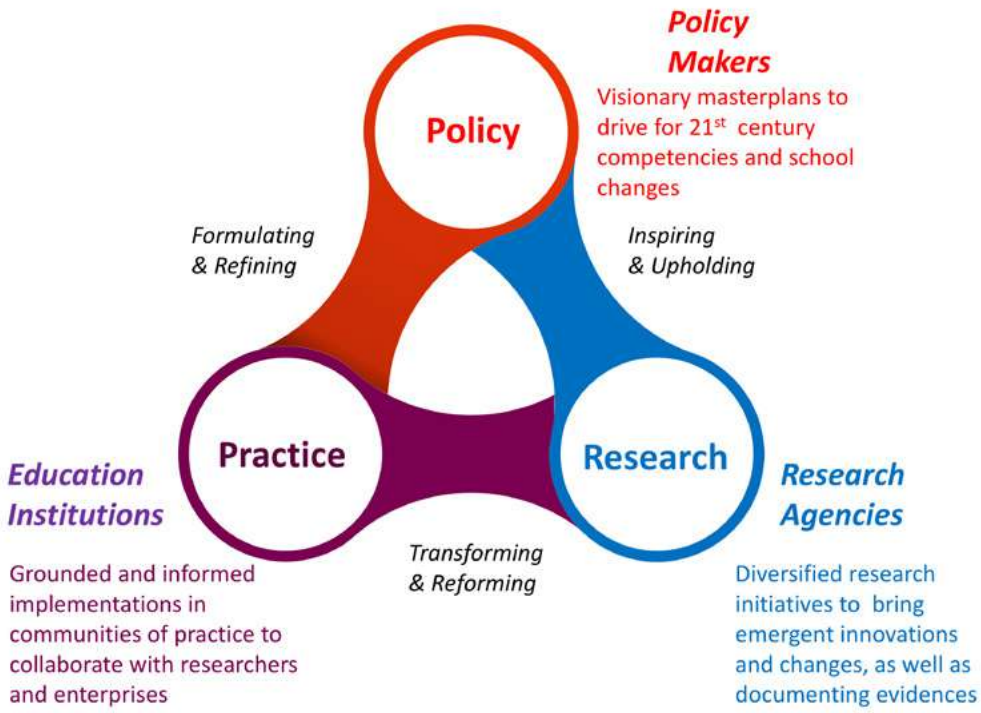
In the process of formulating and refining policies, Singapore's Ministry of Education has specific needs, some of which might be able to be informed by findings from educational research. For example, the goals of one of the previous masterplans of ICT in education is to use ICT to support collaboration and to promote self-directed learning. Outcomes and broad directions specified at the macro-level needs to be operationalized to meet the social-cultural contexts and constraints at the ground (micro-level). Thus we need researchers to work at the meso-level to derive and articulate concrete examples of how teachers and students can use ICT in these two strategic areas, with evidence of learning efficacies. In one such project, researchers work with teacher practitioners to use the GroupScribbles tool to create tasks that support rapid collaborative learning in the classroom, creating pathways for realizing collaboration. In another project, researchers work with a school to create lessons in science using the seamless inquiry learning approach using mobile devices, thus creating a model for realizing self-directed learning together with the necessary teacher professional development models.

"Close tripartite relationship between the education authorities, educational institutions such as the schools, and the researchers in the universities, can support a virtuous cycle of research, policy, and practice."

Education funds have also been devolved to educational zones, clusters and schools so that they have autonomy to use their funds to meet the needs of their specific school niches, such as supporting computing-related applied learning programs. These needs can include collaboration with researchers to bring out innovations in classroom interventions or to provide professional development workshops or courses for teachers. Researchers can also initiate new novel areas of research, and work in collaboration with schools to experiment with improvements in current classroom practices.

Such a close tripartite relationship (Figure 1) between the education authorities, educational institutions such as the schools, and the researchers in the universities, can

Figure 1. Policy-Research-Practice Tripartite Relationship

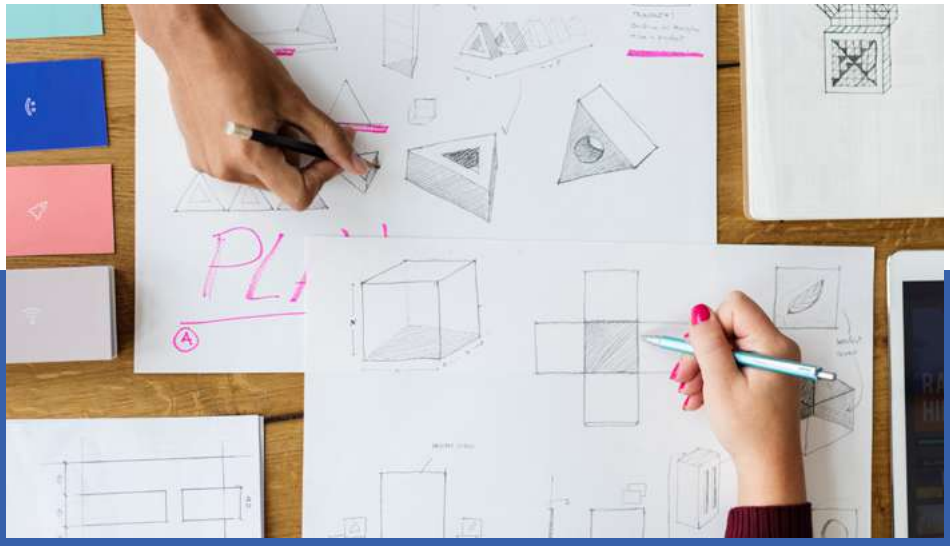


support a virtuous cycle of research, policy, and practice. This results in a tighter nexus of research, practice and policy that sees research being channeled towards bringing out the potential for practical application and for relevance in informing policy.

In a more centrally directed education system, policies are articulated by government officers oftentimes involving partnerships and committees that comprise university professors. The policies initiated can be bold, forward looking and may involve substantial changes to the status quo, and have very strong traction in implementation in a culture where teachers do abide with policy guidelines drawn up their leaders. In the US, where there is a culture of private entrepreneurships and autonomy, a lot of startups provide innovative and novel ways of education and learning, some of which can provide real disruptions to current ways of delivering education and training. In contrast, the Singapore system of classroom practices may represent a more balanced and unique model. It has been honed and refined over the years to a reach some form of steady state, evolving towards fully functional and efficient processes over time, calling for more collaborative, inclusive and concerted efforts from all stakeholders to strive for the changes and improvements in and out of classrooms.

What implications can entrepreneurs draw? The wisdom drawn from education research indicates that partnerships of entrepreneurs with practitioners and policy makers are more likely to lead to continuous improvements, sustained changes, and potential for scaling. Different models of entrepreneurship partnership apply in and strive in different countries. There may be no one model that can be scaled up to all countries. New models of education and training can bloom, grow and develop in diverse ways in countries and regions of the world, adapting to their needs and visions. More dialogues and interchanges among these models will be both significant and beneficial. Entrepreneurs need to be involved and engaged in the communications and to build awareness of nuances of different models that bring about a range spanning incremental to disruptive improvements to education.

III.b



Art Thinking: A method to create the improbable with certainty

by Sylvain Bureau

Scientific Director at Jean-Baptiste Say Institute, ESCP Europe

From learning what is to learning what could be

The Coca-Cola bottle is an emblem of the 20th century: it symbolizes the society of certainty. A society where companies produce standards that are diffused throughout the world with the same format, over and over again. The quality rate is extremely high and only minor changes happen through incremental innovations. To support this society of certainty, students learn established truths and are taught to reproduce what is. In the 21st century, excellence and certainty are required, but they cannot be sufficient for two main reasons.

First, there is a new industry of the improbable, the Silicon Valley. Every year, this ecosystem produces new startups which offer improbable solutions. The massive diffusion and impacts of AirBNB, Uber or Facebook were unpredictable and implausible. Even if the success rate is extremely low, this industry creates the improbable with certainty. To face these recurrent disruptions, existing companies need to make the improbable as well, i.e. they need people who know how to create what could be, and not only what already is.

"Two forces threaten the world: order and disorder"

Paul Valéry

The second reason lies in the growing automation which produces the probable with no human intervention. The automotive sector is a classic case: from the production stage to the actual use of cars, people are replaced by robots. Humans however, are still superior to machines when it comes to creating the improbable. Management, whose primary task was to optimize the manufacture of certainty, will have a limited role to play (there will be less need for managers), making way for entrepreneurship whose objective is to manufacture the improbable (there will be more need for entrepreneurs).

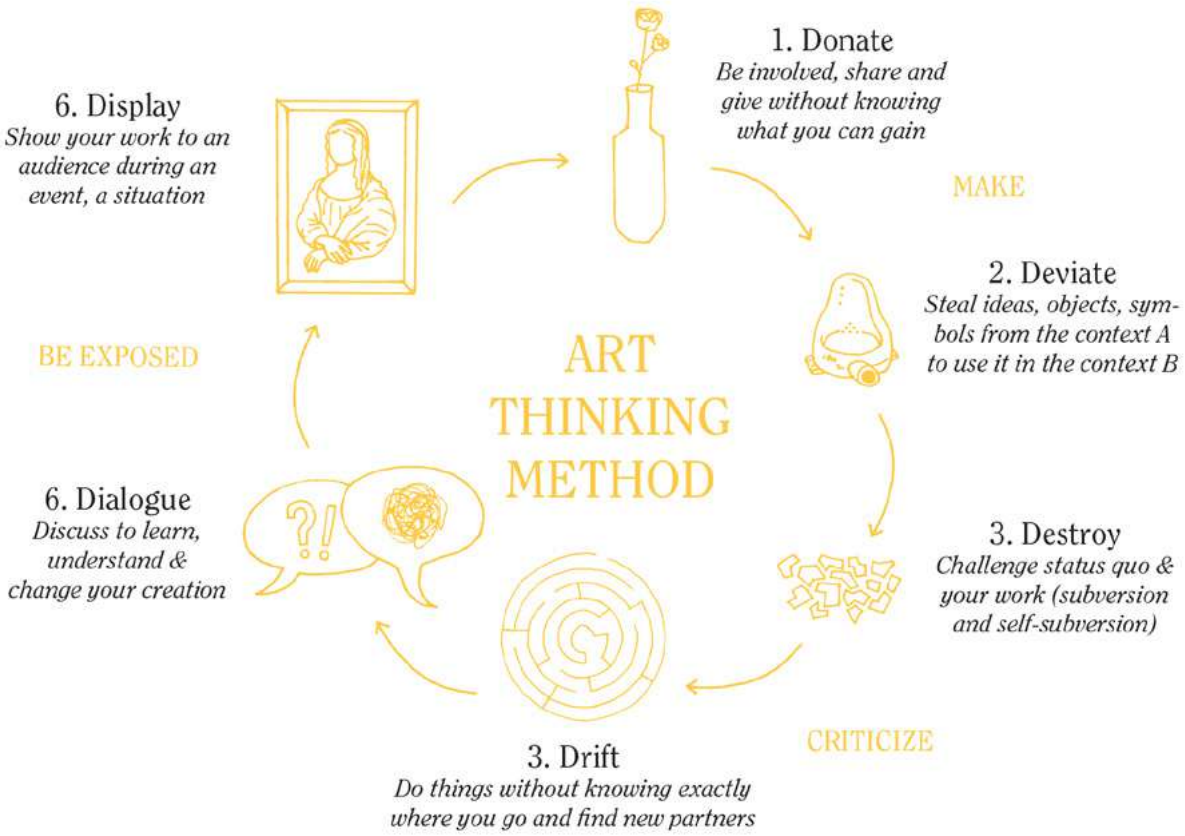
In the 20th century, creative and entrepreneurial activities were limited to very few professional groups: artists, designers, architects, few innovative entrepreneurs. In the 21st century, creativity has spread into an increasing number of professional worlds. The Art Thinking method that I introduce in the following section has been designed to make creation accessible to those professionals who do not appear to be creative at the outset, and to train the younger generations, who will increasingly need to be creative experts.

The Art Thinking Method: A solution to fabricate the improbable with certainty

"Art is what makes life more interesting than art"

Robert Filliou

Art Thinking is a method that I created because I believe that anyone can be (and should be) able to fabricate the improbable to change his/her world. I define Art Thinking as an agile method that makes it possible to create the improbable with certainty. This method enables you to create unpredictable, implausible and incredible outcomes if you develop six art-inspired practices. The goal of this method is not responding to the needs of clients or being empathetic with users. Just like artists, your main goal is to challenge mainstream values that are taken for granted assumptions. And it starts by exploring what makes you angry, passionate, excited.... Just like artists, your objective must be to create the improbable which disturbs our minds and souls, to go beyond our current reality.



Improbable: A workshop to learn Art Thinking

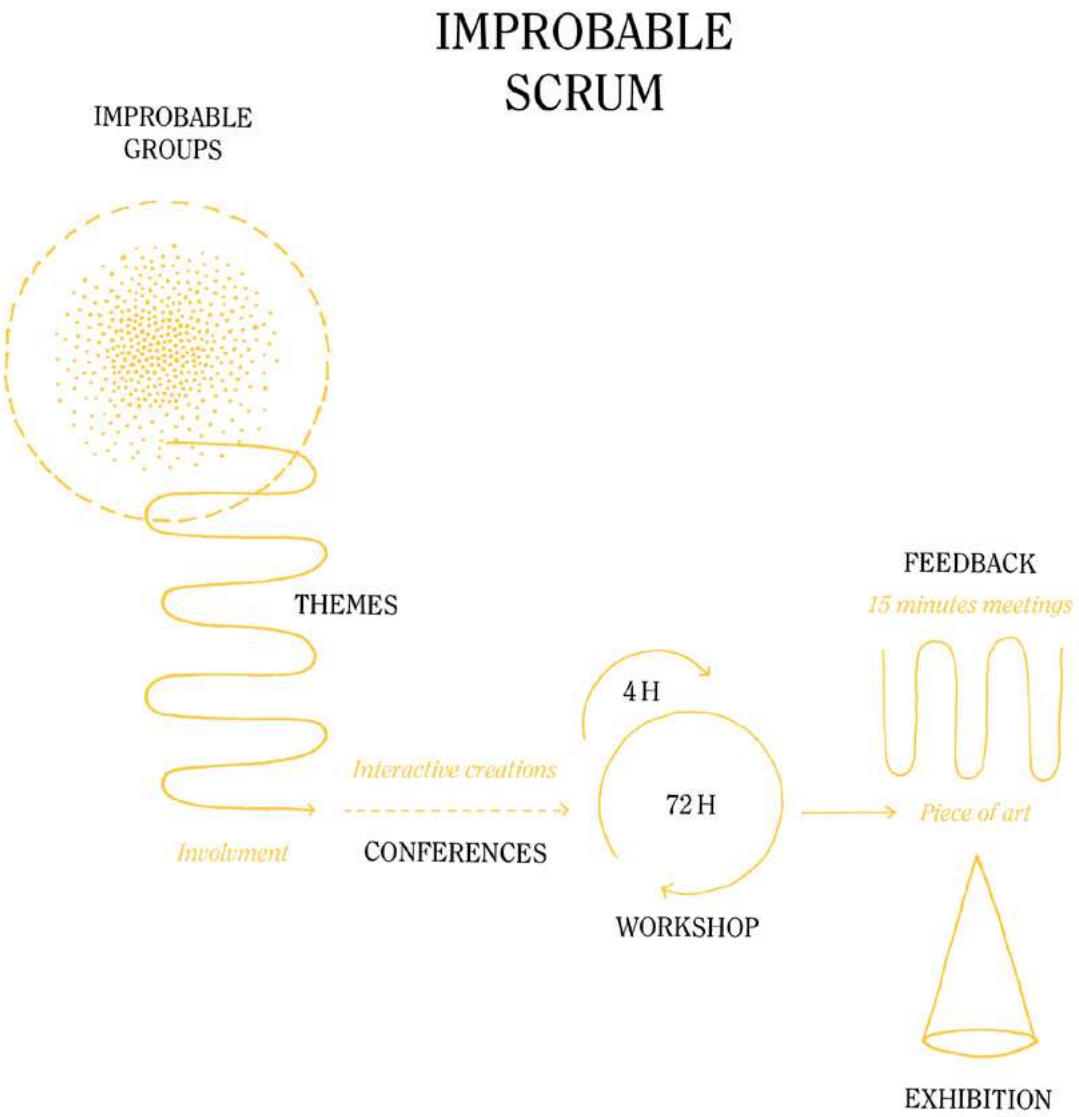
Improbable is a 3-day seminar designed by artist Pierre Tectin and myself to teach Art Thinking (please see below the figure which details the improbable scrum). Each group of participants chooses a theme related to a socio-technical trend (blockchain, sharing economy, privacy...). They experiment with the 6 essential practices described above during 6 sessions where an artist and an expert in entrepreneurship introduce expertise in these fields and give regular feedback. The first day is held in an ordinary classroom. The other sessions are held in creative spaces. The ideal configuration is to have spaces with both production and display possibilities (at ESCP Europe we have the incredible opportunity to carry out our workshops at Centre Pompidou, the second largest modern art museum in the world, but an empty room with bare walls is good enough). In order to enrich their journey and their creation, participants should regularly explore urban universes. You basically need nothing else than a city and a room.

"Because entrepreneurs are closer to artists than any profession, we should look at how artists are trained to rethink the way we train entrepreneurs"

Steve Blank,
Co-Founder of Lean Startup ,
Adjunct Professor Stanford

Attending this seminar produces three main impacts. First, you learn the essentials of entrepreneurship (entrepreneurial leadership, prototyping, resilience, networking...). Second, you create an improbable piece of art which challenges the status quo. Third, you get to be part of a scenius; a collective where you can discuss and find resources to develop your creation. Entrepreneurs just like artists need a collective to improve. To this day, 1500 students, entrepreneurs and executives have participated in an Improbable workshop and were invited to join the collective. Initially, the improbable workshop was launched at ESCP Europe (Paris, Berlin, Madrid, London, Torino and Warsaw) and since a year, is also taught at Stanford University, HEC Montreal, Oulu University in Finland and Mistletoe in Japan.

Today the probable is causing a massive ecological and social crisis. For that reason, I believe that we need to produce the improbable to find new alternatives. In the same way that Design Thinking made design accessible beyond Design Schools, Art Thinking could make the power of creation accessible to anyone beyond Art Schools. It is time to unlock the full potential of creation before our planet becomes uninhabitable.



To get an illustration, please visit *this website* (http://www.bubble-vr.com/portfolio-projects/la-fabrique/) which offers you a visit in a famous Parisian Art Gallery, which exhibited 10 pieces created during an Improbable seminar.

If you want to teach Improbable or attend an Improbable workshop and become an artist for 3 days to change your world, please contact the *Art Thinking Collective*.

III.c

Four pillars for a successful entrepreneurial pedagogy

by Alain Fayolle

Distinguished Professor and Research Centre Director at emlyon business school

Our aim, in this article, is to show that it is possible to develop students' entrepreneurial spirit by approaching the issue from a pedagogical perspective.

How can we develop the entrepreneurial spirit?

Entrepreneurship is a transversal skill that is expressed in a way of thinking and acting, in a mindset associated with initiative, risk-taking and action (Surlemont & Kearney, 2009). This transversal skill is essential today because in order to succeed in life, it is increasingly necessary to take initiative, and to be creative, persevering and capable of quickly finding the most appropriate solutions to the difficulties and problems that arise.

One of the key questions in relation to our education systems is how we can develop entrepreneurial spirit among high school and college students. How can they be encouraged to develop project-oriented attitudes, to achieve goals that are important to them and to society, to innovate and to create economic and social value? In recent years, initiatives to implement actions and provide teaching in the field of entrepreneurship have multiplied within educational institutions. But what proof is there that these initiatives do contribute to the development of young people's entrepreneurial spirit? In the absence of such evaluations, we are entitled to express doubts about such initiatives. Indeed, they appear to be hampered by the challenge of fully grasping what the spirit of enterprise actually is and by the inertia of education systems that give little encouragement to teachers and students to embark on this path.

"Empowering, experiential, cooperative and reflective."

We therefore argue that, in addition to existing approaches focusing on content (entrepreneurship, enterprise), it is wise to place the development of entrepreneurial spirit at the centre of the pedagogical approach. The development of entrepreneurial spirit then depends on the willingness of teachers to adopt new stances and methods, and the education system's capacity for change.

The four pillars of an enterprising pedagogical approach

We believe it possible to teach entrepreneurship through transversal approaches using 'enterprising' pedagogical initiatives. Such initiatives strive to facilitate learning that is empowering, experiential, coopera-

tive and reflective (Surlemont & Kearney, 2009).

How can students be empowered? Depending on the subjects, teachers can design learning situations and contexts allowing students to have more autonomy. The ultimate goal is for students to gradually become the main actors in their learning instead of passive recipients, which of course comes along with a change of educational paradigm.

The development of project-based pedagogies also offers new areas of experience. Many things are new for students – the behaviour expected of them is sometimes far from their usual behaviour, as well as their ways of thinking and acting. Experiences based on in-company projects or internships expose students to changes and learning based on these experiences. But this learning must be guided and supervised by teachers trained in this type of pedagogy.
A corollary of experiential learning is that it often seems hard to get by on one's own, as projects can seem difficult, complicated and sometimes complex. Students therefore need others - the project team, the class, teachers and contributors. They learn from and with others, thus promoting cooperative learning.

The last pillar of entrepreneurial pedagogy is reflective learning. Students are often challenged by what they discover, by differences, by the intensity of the experiences and changes they encounter. They therefore learn by analysing these experiences and regularly questioning their knowledge, skills, attitudes and usual behaviour. By reconsidering these, students modify their representation and vision of learning and develop an ability to learn in situations of change.

It seems to us that any teacher can give a little space and time to pedagogical situations that favour lived experience and cooperation, that encourage responsibility and reflexivity. A critical mass of teachers adopting this approach and the accumulation of such experiences across all disciplines can give entrepreneurship teaching both legitimacy and strength.

"We believe it possible to teach entrepreneurship through transversal approaches using 'enterprising' pedagogical initiatives. Such initiatives strive to facilitate learning that is empowering, experiential, cooperative and reflective."

References:

Fayolle A. (2011), "Pédagogie entreprenante et développement de l'esprit d'entreprendre : YES WE CAN !", Technologies et Formations, n°154, 14-17 ;

Fayolle A. (2010), "Pédagogie de l'entreprendre", Soleo (Magazine of the Europe-Education-Formation-France Agency), n°25, p.4-5.

Surlemont B. and Kearney P. (2009). Pédagogie et esprit d'entreprendre, Bruxelles: Editions De Boeck Université.

*III.***d**

Building a Business Creation Factory

by Corey Allen Billington & Rhoda Davidson

Professor at University of Wyoming / Professor at emlyon business school

In the past 10 years, there has been an enormous rise in the number of start-up incubators in the US and Europe. Thirty-two percent of these incubators are run by academic institutions. Entrepreneurs compete for access and teams win start-up resources (e.g. space, budget, coaching, consulting).

This approach works well for those entrepreneurs who already have a business concept, but what about talented people who haven't formalized their ideas but who would make great entrepreneurs? What about someone who has a unique insight about a customer problem but limited business training? How can we attract these individuals who could make excellent entrepreneurs? How can we cheaply improve their odds of launching a successful business?

We suggest that universities are uniquely placed to find these potential entrepreneurs with high quality ideas and to convert these ideas into start-ups. Universities act as hubs to bring together diverse individuals with critical insights, and university entrepreneurship programs can offer access to high quality-low cost labour in the form of students who are learning entrepreneurship.

Our experience working with start-ups leads us to propose the following process (see figure).

Steps for finding & developing entrepreneurs	University support
1. Search for potential entrepreneurs	• Conferences, innovation events, city council events, chamber of commerce events, low key start-up weekends, hackathons
2. Assist potential entrepreneurs to develop excellent value propositions	• Assign a student team undergoing entrepreneurial education • Student team researches and considers numerous alternative value propositions and conducts gladiatorial tests • Potential entrepreneur selects most promising VPs
3. Propose tests that will uncover a viable business model	• Student team considers many possible business models • Faculty provides consulting support in areas of expertise • Student team conducts academic analysis and first market testing
4. Support launch	• Entrepreneur leverages the universities' network and resources to find customers and test MVPs • Entrepreneur recruits start-up team and develops team productivity
5. Incubate start-up	• Entrepreneur is now trained in business methods • Normal incubation processes followed

Figure – Business creation factory workflow

Step 1 – Search for potential entrepreneurs

University entrepreneurship faculty should focus on initiating events that bring together people from different backgrounds and industries e.g. conferences, innovation events, city council events, chamber of commerce events, low key start-up weekends, hackathons. We have found that building social networks is the most effective way to reach these people.

Step 2 – Assist potential entrepreneurs to develop excellent value propositions

Most universities have entrepreneurship classes at undergraduate or postgraduate levels. Relative to the potential entrepreneur, these students don't have in-depth knowledge or industry insight, but they are trained in lean start-up methodologies. Student teams are formed and matched to potential entrepreneurs under the guidance of the entrepreneurship professor. Each student team is asked to explore many (up to 500) customer-offering combinations through market assessment and analysis, with goal of finding an excellent value proposition.

"What about talented people who haven't formalized their ideas but who would make great entrepreneurs? What about someone who has a unique insight about a customer problem but limited business training?"

The potential entrepreneur now selects his or her value proposition, based on preference and intuition. At the end of this step the entrepreneur has a value proposition that has a higher degree of success than their original idea.

Step 3 – Propose tests that will uncover a viable business model

The student team continues to assist the entrepreneur by hypothesizing and testing aspects of the entrepreneur's business model. They are assisted by faculty who can provide expert advice in business domains e.g. pricing, marketing, channel access, supply chain partners, or in technical domains e.g. engineering, prototyping, legal. By the end of this step, the entrepreneur has one or several minimum viable products (MVPs) and an associated business model.

Step 4 – Support launch

Assisted by the student team and university resources, the entrepreneur finds their first customers and tests the business model hypotheses using MVPs. The start-up team is staffed based on a clear understanding of the activities that will be required, based on a competence assessment. Together the team establish their testing plan of customer needs and offerings over time to reach an industry sweet spot.

Step 5 – Incubate start-up

Now the university (or external) incubation process can take over.

This business creation factory process multiplies the number of entrepreneurs that start businesses by cultivating individuals with market or technical insights but who are lacking in business skills. Entrepreneurship students learn by doing when they support the launch of a business and improve their entrepreneurial competences.

III.e

Entrepreneurial Pedagogy and the French Education System: Evolution or Revolution?

by Alain Fayolle

Distinguished Professor and Research Centre Director at emlyon business school

Is it conceivable, or even possible, to adopt an entrepreneurship-based pedagogical approach in the context of the French education system?

The answer lies largely in individual and collective awareness. Every teacher must be convinced that he or she can do it and that it does not solely depend on others or the education system as a whole. Certainly, teachers have already understood the virtues of entrepreneurship-based teaching and are trying to develop a number of different elements: projects, 'problem' situations, internships, and other pedagogical experiences. But these initiatives are not always successful because of one or more missing dimensions, and it is clear that a critical mass of teachers remains to be convinced. To facilitate the adoption of these new teaching methods, greater awareness and teacher training activities are needed. An extra boost might be given by providing teachers with more autonomy in relation to taught programmes and more room for manoeuvre in exercising their profession. This might be helped by the arrival of a new generation of teachers with different attitudes and behaviour types compared to their predecessors (Gumbel,2010).

"It demands that we question a system that focuses too much on the selection and preparation of our political, administrative and economic elites, categories which accommodate neither Schumpeterian entrepreneurs, nor business creators, nor those who might change the world of tomorrow and make it a better, fairer place."

At the collective level, this issue clearly concerns the education system, but also our society as a whole. An education system is only a reflection of what a society is and what it values. We can legitimately wonder how much importance French society gives to entrepreneurship. Objectively, representations of ordinary entrepreneurs and of business creation are not always shown in a positive way. Our society values diplomas, a successful academic career, which still give, to some extent, the assurance (or illusion) of securing a job for life, even before the age of 25 (Fayolle, 2011). The French dream of seeing their children graduate from elite universities. Few envisage a destiny as an entrepreneur. Our country's education system legitimizes and organizes a real school meritocracy that has profoundly shaped it and has a significant effect on teachers' behaviour. The specificities of the system and particularly its extremes, especially in terms of the preeminent role of mathematics in sorting 'good' and 'bad' students, generates a lot of stress amongst students, practically forbidding the right to make mistakes and hampering the development of self-confidence (Gumbel, 2010). If we believe the results of international surveys and recent

research by sociologists, educational specialists and 'users' of the system, it seems it is high time to accept the need for attitudes to evolve within the education system and to envisage profound changes (Baudelot & Establet, 2009).

The development of students' entrepreneurial spirit therefore also involves the development of a culture that is more favourable to entrepreneurship. It demands that we question a system that focuses too much on the selection and preparation of our political, administrative and economic elites, categories which accommodate neither Schumpeterian entrepreneurs, nor business creators, nor those who might change the world of tomorrow and make it a better, fairer place.

References:

Baudelot C. and Establet R. (2009). L'élitisme républicain, Paris: Editions du Seuil, La République des Idées.

Fayolle A. (2011), "Pédagogie entreprenante et développement de l'esprit d'entreprendre: YES WE CAN !", Technologies et Formations, n°154, 14-17

Gumbel P. (2010). On achève bien les écoliers, Paris: Grasset.

Start-up Bootstrapping in the Information Age


by Corey Allen Billington & Rhoda Davidson

Professor at University of Wyoming / Professor at emlyon business school

Traditionally, the focus of entrepreneurship training has been on growing a business quickly. A would-be entrepreneur leaves their day-job, validates a value proposition, and pitches to investors. Scaling-up fast is the mantra. Investors are highly selective and push the business to grow as quickly as possible. The entrepreneur and his or her team are encouraged to show their commitment to the start-up by taking on huge personal risk. The implicit dream is to get rich quick, sell-out, and retire.

This traditional push for speed, reduces the start-up's probability of success because risk is higher than need be. Investors typically care less about the success of an individual entrepreneur but rather look at a portfolio of investments.

The good news is that in the information age of today, it is possible to de-risk businesses without involving external investors. We suggest that starting a business has never been cheaper and easier to accomplish because resources can be purchased in the form of services. The entrepreneurs of today should not focus on speed, but rather be looking for stealthy ways to de-risk their business approach.

"This traditional push for speed, reduces the start-up's probability of success because risk is higher than need be."

Using the lean start-up methodology, entrepreneurs are encouraged to use the scientific method to formulate and test hypotheses that de-risk their value propositions and associated business model. Some examples of the resources in the form of services available today for de-risking include:

- Flexible staffing using the gig economy platforms e.g. Upwork for professional services
- Financial payment and e-commerce services e.g. Paypal
- Tools for combining apps to create web sales presence e.g. Zapier
- Mature channel infrastructure for selling niche and limited-edition products and services e.g. Amazon, Etsy, Ebay
- Customers who are proactively searching for limited-edition specials

An entrepreneur can test many different value propositions and target different customers without requiring outside investment, making bootstrapping more feasible now than ever.

We suggest that entrepreneurs should consider the initial de-risking phase of their business as a hobby. No need to leave the safety of their employer with its benefits, especially when there are dependent involved.

Instead, we suggest mapping out a de-risking plan to reach the "sweet spot" in the industry through a trajectory of trial and error. The sweet spot is the customer-offering combination that the entrepreneur believes forms the most attractive value proposition in an evolving industry. Even if he or she thinks they knows where this sweet spot may be located, it is better to test in a sequential way and to approach this sweet spot obliquely (Figure 1). Going slowly and inexpensively may yield better overall results than rushing to the sweet spot, which has the risk of alerting others and drawing competition. And what's more by working in this way, the entrepreneur gains deeper insights into their customers and their offering, which allows re-formulation of their views of the sweet spot.

"We suggest mapping out a de-risking plan to reach the "sweet spot" in the industry through a trajectory of trial and error."

For instance, an entrepreneur seeking to use blockchain technology to decrease market imperfections and wastage during the sales of tomatoes in rural areas, might start by creating a simple service using spreadsheets and databases with SMS alerts. Then once the market is proven, the blockchain component can be added to the offering.

This de-risking approach allows the entrepreneur to de-risk before the need to search for funding, ultimately creating a much higher return for the hard work of the entrepreneur.

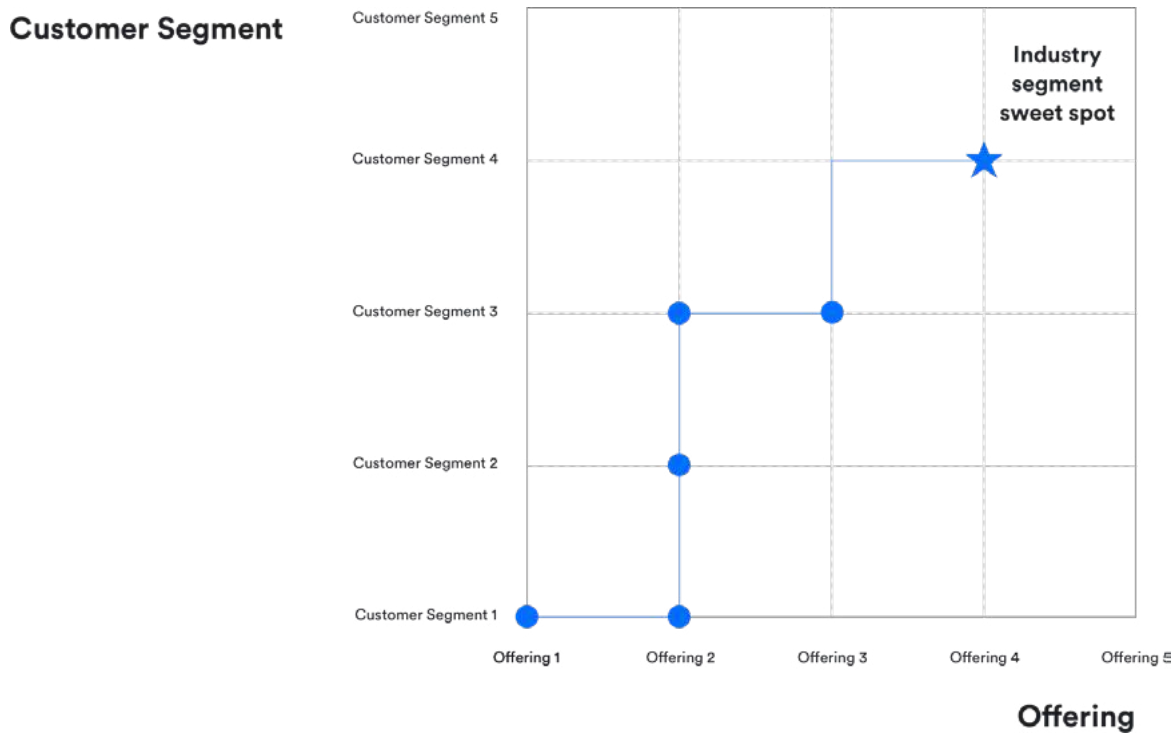
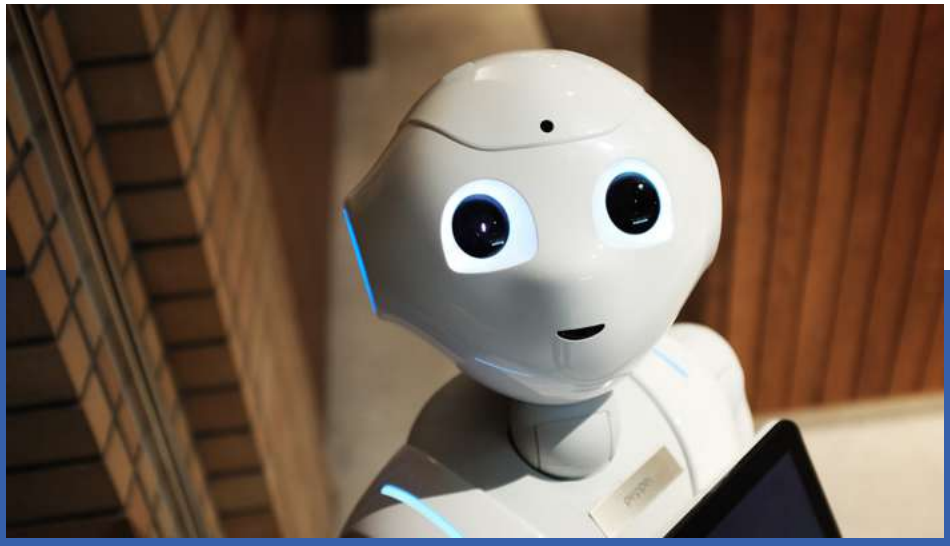


Figure 1 – Example bootstrapping plan to reach industry sweet spot.

III.g



Machine Teaching

By Pierre Dillenbourg, Thibault Asselborn, Wafa Johal & Teresa Yeo

Professor / Researchers, Swiss Federal Institute of Technology (EPFL)

The impact of AI on education raises hopes and fears. This impact spreads over 3 layers: (1) Methods: AI may enhance the effectiveness of learning technologies; (2) Contents: AI is changing what students should learn or should not learn anymore; (3) Management: AI, especially data science, offers new ways to manage education systems (e.g. predicting students' failure). This contribution concerns level 1, where AI is expected to enable a fine adaptation of instruction to individual learners needs: over time, a system may learn which learning activity is optimal for a certain learner profile.

"We don't mean AI won't benefit to education, we aim to avoid the disappointment that inevitably follow over-expectations. A rational approach is to stop talking about AI, because this term is too general."

These expectations rely on a few success stories such as the math tutors developed at CMU but we should be careful not to generalize these successes. Some of the major issues are from our perspective: First, the predictions of optimal next learning steps to recommend to an individual learner that are learned by the system are specific to the context in which they have been acquired. If the system discovers specific profiles for kids learning about fractions, these profiles won't be relevant for teenagers learning to solve equations. Second, these profiles can only be elaborated from massive datasets, while most entrepreneurs in the EdTech sector access rather small amounts of data. Third, when new software is developed, the dataset is initially empty and thus the system's recommendations random (the so-called 'cold start' problem). While collecting data with the first 5000 learners the system needs to constantly adapt recommendations. Fourth, during the data acquisition phase, if an algorithm predicts that the next activity for John should be Activity-X, but has very rarely tested Activity-Y, should it take the risk of trying Activity-Y, i.e., «sacrificing» a learner for the sake of gaining knowledge (the so-called 'exploration/exploitation trade-off' problem). Fifth, an algorithm used in education should be able to explain the reasons of its decision to the learner, while deep neural nets are not able to explain their results.

By pointing out these challenges, we don't mean AI won't benefit to education, we aim to avoid the disappointment that inevitably follow over-expectations. A rational approach is to stop talking about AI, because this term is too general. AI is a broad family of algorithms with different properties. For instance, convolution networks are efficient for detecting areas within a static picture while recurrent networks are better suited for capturing the dynamics of a sequence

of events. If we address the educational impact in terms of specific algorithms instead of AI-in-general, then we might pay attention to two recent classes of algorithms, namely machine teaching and generative adversarial networks.

In supervised machine learning, the algorithm receives an example, e.g. picture-3465, and a label such as 'elephant' or 'non-elephant'. This picture may just be the next one of a set of thousands of labelled pictures. Now, if the 3464 first pictures were African elephants, the system would learn less from a 3465th African elephant picture than if an Asian elephant picture was proposed. Similarly, if previous pictures were mostly about aged elephant, it would be better to select a young one. If most of them were side pictures, a frontal picture would improve more the knowledge acquired by the algorithm. In other words, if the examples were not fed to the learning algorithm in random order but strategically selected, one would optimize the learning performance of the algorithm. In a classroom, selecting examples is the role of the teacher: she knows that if all examples of squares she gives to learners are horizontal, learners will logically infer that a square with 45 degrees rotation is not a square. The algorithm that determines the optimal sequence of examples that are diverse and sufficiently dissimilar from what has been shown previously, to be provided to a machine learning algorithm is metaphorically called a machine teaching algorithm.

"The algorithm that determines the optimal sequence of examples that are diverse and sufficiently dissimilar from what has been shown previously, to be provided to a machine learning algorithm is metaphorically called a machine teaching algorithm."

The basic idea is that two agents, in our case an artificial learner and an artificial teacher, learn by playing 'against' each other. The word 'against' is misleading because the teacher aims to optimize the learner's goal, like playing tennis 'against' your coach. There is however a field of machine learning, called generative adversarial networks, where the goal of the 'teaching' agent actually is to defeat the learning agent. Typically, once the learner has acquired a concept, the teaching agent will generate an instance that it expects the learning agent to misclassify. Similarly, a teacher often helps student to refine his concepts by 'tricking him with' usual 'misconceptions', for instance asking him whether a whale is a mammal or not.

This metaphor of teaching/learning agents should not be stretched beyond this functional similarity, machine teaching does not claim modeling human teachers or human learners. However, it paves the road for exploring novel approaches in education. For instance, these simple models can be used to simulate the use of a learning environment with 10'000 artificial learners, before starting to use them with human learners. Since running experiments in a real classroom setting potentially raises several ethical issues, these simulations allow us to learn about the right balance for some parameters of the algorithms before exposing human learners.

List of contributors

Forewords

Finocchiaro, Alejandro
Minister of Education, Culture, Science and Technology, Republic of Argentina

Sanguinetti, Bruno
G20 YEA President for Argentina

Insight Papers

Benichou, Frédérick
Co-Founder, Coorpacademy

Billington, Corey Allen
Professor at University of Wyoming

Bonnafé, Jean-Laurent
Director and CEO, BNP Paribas

Bureau, Sylvain
Scientific Director at Jean-Baptiste Say Institute, ESCP Europe

Davidson, Rhoda
Professor at emlyon business school

Dehler Zufferey, Jessica
Head of R&D, Coorpacademy

Dillenbourg, Pierre
Professor at Swiss Federal Institute of Technology

Fanon, Julien
Senior Manager, Accenture Strategy

Fayolle, Alain
Distinguished Professor and Research Centre Director at emlyon business school

List of contributors

Hintermann, Francis
Global Managing Director, Accenture Research

Kamal-Chaoui, Lamia
Director Centre for Entrepreneurship, SMEs, Regions and Cities, OECD

Laurenceau, Céline
Managing Director, Accenture Strategy

Looi, Chee Kit
Professor at Nanyang Technological University, Singapore

Mitre, Arnauld
Co-Founder, Coorpacademy

Roumilhac, Alain
President, ManpowerGroup France

Sentilhes, Grégoire
President and Co-founder of Nextstage, Citizen Entrepreneur and G20 YEA for France

Tassetto, Jean-Marc
Co-Founder, Coorpacademy

Vazirani, Madhu
Principal Director, Accenture Research

Weinberger, Mark
Global Chairman and CEO, EY

Wu, Longkai
Scientist at Nanyang Technological University, Singapore

Acknowledgements

This collection of insight articles would not have been possible without the contribution and enthusiasm of many people. Our special thanks goes to Bruno Sanguinetti and **CAME JOVEN** for the support as well as G20 YEA knowledge partners **EY** and **Accenture**. We thank all of them very much.

www.g20yea.com/reports

Editorial Team

Jean-Louis Grégoire

Jessica Dehler Zufferey

Audric Dézièré

Citizen ENTREPRENEURS engagés dans le 21e siècle

coorpacademy