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MOOCs and Soft Skills in demand for today's labor markets

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ABSTRACT

Modern digital economy relies mainly on formal infrastructures and services bound with flexibility, adaptability and innovation while human capital lies in the capacity to form connections. This environment is enhanced by MOOCs as they offer the ability to form strong network aspects of connection between people and institutions in terms of creating, sharing and enhancing knowledge, services and skills in effective ways. Thus, the past twelve years or so, the viability of MOOCs has been a constant challenge from an educational and an economic perspective. In order to adapt to the recent continual changes, people tend to engage in lifelong learning opportunities so as to increase their personal capital and remain marketable till retirement. MOOCs appear to be one of the means to achieve such goals. This is highly supported by the constant rising of online courses worldwide that promote a wide range of topics and specializations together with credentials and even academic credits. At the same time, digital transformation requires many new skills in most fields, mostly soft or non-cognitive skills that are not actually taught methodically during school or university years. Yet, these skills are important assets throughout adult professional and personal life. For instance according to various popular researches, it is estimated that 65% of children entering primary school today will end up working in completely new job types that don't yet exist. It is obvious that this is a massive change for the next twenty years and even though it is more or less expected, it still requires a wide set of skills (adaptability, flexibility, mobility, connectivity, team spirit, emotional intelligence, collaboration, critical thinking, etc.) for individuals as well as for societies. As a result, educational systems are called to adopt various changes in order to integrate skills development in their typical programs. MOOCs could hold a substantial role in the implementation of such adaptations, yet at the moment they are being commonly used mostly for sharing knowledge in general or specific fields. In the present paper, the above matters are discussed thoroughly together with the possible ways that MOOCs could be used in skills in demand development. In addition, a research is conducted with two groups of twenty adult students each, using both qualitative and quantitative methods in order to conclude whether skills development could be advanced by participating in MOOCs courses and what

might be included in the instructional design of MOOCs that advances skills development, in order to maximize the adaptation of the human capital to the trends of the recent labor markets.

Introduction

The term MOOC stands for Massive Open Online Courses. So MOOCs are online educational courses open to any large, massive number of potential customers. As a term it originates in 2008 with a course on 'Connectivism and Collective Knowledge', led by Stephen Downes and George Siemens through the University of Manitoba, Canada, gathering 2000 participants from all around the world despite the fact that as an event wasn't thoroughly advertised (Mackness et.al, 2010).

Much earlier, in 1971, the Open University of the United Kingdom adopted a principle of MOOC philosophy by offering free courses, leading to open education (Gourley & Lane, 2009). In 1997, California State University developed a program of online library resources for free access learning for their students, offering in this way open educational resources through the MERLOT program (Multimedia Education Resource for Learning and Online Teaching) with the purpose of sharing resources and specific learning materials. In 2001, the Massachusetts Institute of Technology (MIT) announced the Open Course Ware (OCW) project, whose purpose was to make available to the public, free of charge, all learning materials developed and employed in courses under a free license; facilitating the concept of MOOCs. Around the same time, relevant nonprofit initiatives from Oxford, Yale and Stanford Universities took place, through the project Alllearn (Alliance for Lifelong Learning), creating open online courses in various subject areas of general interest, without credits, targeting mainly the alumni of the three institutions. Since 2002 these courses have been open to the general public. As a result, 2001 is generally considered the boom year for online courses (Jokivirta, 2006). Consequently, the acronym MOOC has since been applied to a variety of online and blended courses.

During the last decade, MOOCs have widely attracted the attention of all educational communities and even every stakeholder that holds an interest in any kind of educational and training programs. A main reason is the fact that MOOCs change completely the relationship in the teacher/student ratio and the correlation of the number of students in each class, adding extra values that meet the demands of the modern knowledge society, making education accessible to all, at any stage and age (Atiaga L. & Guerrero-Proenza R.S., 2016).

Today MOOCs offer two enrollment options. One option is *Free Auditing* with access to videos, images, readings, presentations, discussion forums, assignments, grades, tests and quizzes, etc. and the second option is *Paid Enrollment* with access to all content including certificates of completion and even credits in many cases. So actually, despite the fact that MOOCs contain the open philosophy, in many cases online courses involve pay walls, which leads to the obvious conclusion that they are not truly open anymore or at least to the extent they were in previous years. Yet there are many MOOCs such as Coursera, edX, Udacity, etc. that offer financial aids or scholarships. Of course the ability to earn academic credits from specific institutions is very important; as such certifications add extra honor to the profile of the holder, while providing credits that are considered of the same value as traditional academic credits.

In addition, today, it is possible to obtain a series of related MOOCs that allow the user to gain a deeper understanding of a specific subject which are called microcredentials. Some popular microcredentials include MicroMasters, Specializations and Nanodegrees. To get a microcredential one must earn a passing grade in each of its courses. This is extremely useful for users who need to upgrade with the latest contents in their field of expertise.

Moreover, many universities today, offer full-fledged online degrees based on MOOCs. The first full MOOC-based master's degree (in computer science) was offered in 2013 from Georgia Tech and Udacity. In 2015, the next one (iMBA) was offered from the University of Illinois and Coursera. In 2017, at least nine master's degrees were available through MOOC platforms. In 2018, things really took off, while now (2020) more than 50 degrees are available online through MOOC platforms. MOOC based degrees include a wide range of advantages such as lower cost compared to on-campus degrees, flexibility, 'pay as you go' pricing rules, while they are fully accredited and recognized. In fact, in most cases the final degree does not even indicate that the credential has been earned online. Furthermore, there are some courses, parts of a full degree program that are free or low cost to take. So a learner, who is not actually interested in the final full degree, can still gain a wide range of content and knowledge, with less or no payment, while it is possible to later enroll in a degree program or not. The MOOC-based Master's and Bachelor's degrees that are currently available include fields such as: Computer Science and Engineering, Business and Management, Data Science and Analytics, Cyber Security, IT Management, Public Health, Healthcare and Public Sector Management, etc. Most institutions offering such degrees are from the USA, UK, Australia and France. The MOOC platforms that are commonly used are FutureLearn, Coursera, EdX, Udacity. The cost of a MOOC-based degree is between \$10,000 and \$27,000, while it is possible to be even higher depending on the institution and the degree itself. Usually degrees from US-based institutions tend to come from prestigious and highly ranked universities, so they tend to be more expensive. Obviously the use of MOOCs in institutions offer a wide range of potential profit and revenues such as the possibility to draw participants into full tuition degree programs, the chance to add fees for additional services (certifications), the increased class size that wouldn't be possible in physical classes, the chance to create new courses and programs thus create new charges of extra tuition, licensing fees for use of MOOC material, matchmaking for employees and finally increased brand name. Consequently universities have overall adopted MOOCs as they greatly enhance institutional goals such as extending reach and access, building and maintaining brand, improving economics and educational outcomes, add to innovation and research on teaching and learning, etc. For instance, building and protecting brand serves to attract and retain students, faculty members and partnership opportunities with other institutions, funders and alumni networks.

Furthermore, students and learners worldwide have greatly adopted online courses mainly for the variety of offered subjects either for professional or personal use, freedom and convenience of schedules, support of personal learning speeds, ability to learn a new language or acquire new skills following the personal pace, supplement the existing educational level and even boost job applications and career prospects either by getting credit-eligible courses or verified certifications or just a print-out of the course overview as a proof of completion. The social interaction among learners is greatly supported by discussion forums, posts, shares, ask

for feedback, troll, waste time, lurk, gossip, etc. creating more or less the same environment as the one in a campus, while at the same time it easily cultivates team spirit, problem-solving skills and enhance multitasking skills as one may attend an online course while engaging in some other activity for instance jogging, cooking, having lunch, etc.

The great overall advantages and usefulness of MOOCs has already shown widely during the current Covid-19 outbreak, as nearly all countries worldwide have adopted full or partial lockdown measures so most or all educational services from public and private sectors moved rapidly online, resulting to not violently interrupting educational procedures due to the pandemic. Of course, the whole situation has resulted to various thoughts, as this immediate transition from physical classes to online classes took place in the blink of an eye. Online education has been the only answer to more than 1.5 billion students and youth across the planet that were affected by school and university closures due to the Covid-19 outbreak. The Global Education Coalition (2020) launched by Unesco (en.unesco.org/covid19/education) seeks to facilitate inclusive learning opportunities during periods of sudden and unprecedented educational disruptions. Thus investment in online learning can both mitigate the immediate disruption caused by Covid-19 and establish approaches to develop more open and flexible education systems for the future. According to the same source, the collective actions that can help build more resilient education systems, are to mobilize resources, to develop effective and unified responses, to coordinate actions to maximize impact, to avoid overlap and reach the disadvantaged, to match on the ground needs with local and global solutions and to provide distance education, leveraging hi-tech, low tech and no tech approaches.

The MOOC Learning System

Usually the design of a MOOC is somehow different from courses taught on campus or in classes of any level, especially in the assessment part, as the audience and their needs are different. The goal is pure education, so the instructional design considers the variations and provides space for the learners that join for the pure knowledge and leave and also for those who want to go further in their education or learning. In fact many MOOC courses, in academic levels, have been created as a way to educate on specific areas on topics that mostly reflect the instructor's research and academic work (Scagnoli, 2012).

Therefore when creating a MOOC, there are five important elements for consideration that actually form the instructional design of a MOOC. According to the figure below, the five elements include: Previous Knowledge, New Learning, Checking for Understanding, Engagement and Transfer/Legacy. In fact, content should challenge and interest any participant with any level of expertise in a topic, no matter any kind of past experiences. Sources should derive from diverse perspectives to help participants think and develop deeper understanding of the topic. Different materials such as videos, readings, movie clips and e-books should be used to enrich the experience of learning, understanding and critical thinking. Self-graded activities should be in abundance to allow participants to check their personal understanding of the weekly topic, lesson or discussion while at the same time promote the participants to think deeper about the issues presented during the week. Encourage motivation for engagement and community learning opportunities by developing series of topics within the topic of the class to have their own discussions and learning hubs. Invite participants to use class materials to

trigger conversations and learning. Inspire participants to create digital spaces that may continue the discussion or the information seeking for the topic of the class. Suggest learners to take what they learn and be agents of change or discovery in their worlds of work or life (Scagnoli, 2012).

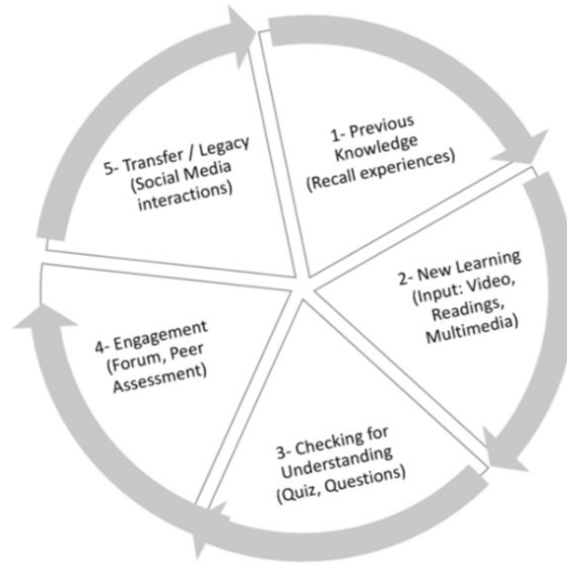


Figure 1. *The five important elements in the instructional design of a MOOC (Image Source: Scagnoli, 2012)*

As MOOCs enroll learners worldwide with different personal, demographic and professional backgrounds, the common thing that unites them all is their interest in the topic of the course, despite the level of personal commitment or motivation. Of course such heterogeneity is always existent in physical classes as well, but being present is easier to make ends meet. Obviously, one of the main challenges is creating an appealing course for all participants, so the prementioned five elements are extremely helpful for the instructor to create a space that offers inspiration and intellectual challenge. In addition, as the basic idea of MOOCs is the fact that learners are in control of where, when and what to learn, this can be implemented by detailed instructional design, producing great benefits simply due to the core of MOOCs' design.

At this point, it is obvious to mention that MOOCs are not a way to access curated information but rather a way to create a healthy and interactive eLearning environment, always bearing in mind that information is not knowledge. This is of major importance, as there is relatively low application of the pedagogical principles in MOOCs design, with the exception of those related to the organization and presentation of the content (Oh, Chang, Park, 2019). In addition, input based teaching approaches dominate in MOOCs, while collaborative and interactive activities are rarely used (Dreisiebner, 2019).

From the above it derives that although MOOCs have existed for several years, in many ways the instructional design of MOOCs is still in its infancy. There have been many approaches that conclude in using the traditional learning theories together with common instructional models such as the ADDIE model.

Recently the learning theory of *connectivism* is considered to be the learning theory for the digital age (Siemens, 2014), as technology is permitted to become part of the student’s internal learning process, adopting the useful tetrahedron of student-teacher-network-content. Connectivism originates in distributed learning, so it appears as actionable knowledge that is based on interactive networks, an idea quite close to the pragmatic way of how human beings learn, that is, interacting with their surrounding world. As MOOCs engage individuals in the learning process by connecting to others and collaborating with others on a specific network, connectivism appears to be the practical learning theory that is able to embrace all these ideas. Such a MOOC is rather a step towards lifelong learning, has independence, work in own space, is an authentic network that ensures that individuals choose what do they want to do, choose how they want to participate and decide if they have been successful (Downes, 2014). As instructors, teachers and educators are reflecting on how learning has changed, the accompanying implications are the proper ways to design the spaces and structures of today’s learning procedures. So teaching roles are updated and upgraded as teachers are now called to be aware of their new roles that include design, organize, perform, evaluate and in general adjusting the act of learning for current generations by taking into account the impact of ICT in every sector of modern life (Herlo, 2017).

Common proposed materials and activities that facilitate learning in a MOOC course, consistent with the above ideas, are described below (Scagnoli, 2012):

Element	Description	Proposed Activities	
PREVIOUS KNOWLEDGE RECALL EXPERIENCES	Triggers for thought or discussion, content that may appeal to students’ reflection and will help as a starting point for the topic. Everybody will process the information in a different way, based on their own experiences, and everybody will bring new insights to the interaction. Be ready to accommodate people with no knowledge about the topic to people with PhD’s in the subject.	Video Clips Case Studies Multimedia productions News	Required to complete course
NEW LEARNING INPUT	Rich amount of sources that come from diverse perspectives to help participants think and develop understanding of the topic.	Instructor’s short videos (5-10 min) Readings, Videos, digital contents from other sources	Required to complete course
CHECK FOR UNDERSTANDING	Self-graded activities that allow participants to check their understanding of the weekly topic and at the same time make the participant think deeper about the issues	Multiple Choice & True/false questions Matching exercise Investigate and	Required to complete course

	presented in the week. Activities can go from simple to complex, from identify and respond, to analyze, to search and respond, etc.	complete & Fill in blanks questions	
ENGAGEMENT	Encourage participants to select topics within the topic of the class to have their own discussions and learning hubs. Invite them to use class materials to trigger conversations and learning.	Community Regulated Discussions Digital materials that result from the discussions	Optional Tends to motivate learners
LEGACY	Motivate participants to carry on: Create digital spaces that will expand and continue the ideas of the lesson. Participants are encouraged to take what they learn and be agents of change or discovery in their worlds of work or life.	Spaces that students may create to continue conversation: blog, wikis, website, social media, forums, chats, etc.	Optional Tends to motivate learners

The above activities imply new liabilities for the teacher such as amplifying, curating, wayfinding and socially-driven sense making, aggregating, filtering, modeling and persistent presence. A teacher is a node in a learner's network, so messages that the teacher amplifies have a greater probability of being seen by the participants. So the network of information is based on the actions of the teacher in terms of drawing attention to signals (content elements) that are particularly important in a given subject. A teacher is a curator in the sense that he/she arranges the key elements of a subject in a manner that learners bump into them throughout the course. Instead of the old-fashioned '*You must know this...*', the curator includes critical concepts of the lesson in blogs, posts, chats, forums, etc. so such frequent encounters, enhance learners' understanding. As learners grow their personal learning network, they usually develop a way to filter abundance. In this sense, the network becomes a cognitive agent helping the learner to make sense of complex subject areas by relying not only on personal readings and resource exploration but also by permitting his/her social network to filter ideas and draw attention to important topics. Making sense in complex environments is a social process. Aggregation appears to be a very promising area, as it can reveal content and conversation structure of the course as it unfolds, rather than defining it in advance. Filtering resources is an important educational role, as it helps learners to develop and focus their understanding on a certain topic. The teacher provides one stream of filtered information, while the student is making selections based on the received multiple information streams. So the singular filter of the teacher has morphed into numerous information streams, each filtered according to different perspectives and views. Moreover, what cannot be understood or communicated by lectures and learning activities alone, can be addressed through modeling by the teacher. Finally an educator should hold some online identity, where he/she can express himself/herself and be discovered. In this way the teacher can provide summary contents, discussions, critical perspectives and direct learners to resources that they may not have encounter before. So

persistent presence in the learning network is needed for the teacher to amplify, curate, aggregate, filter content and model critical thinking and cognitive attributes (Siemens, 2011).

The set of the above ideas transfers teaching and learning into a new dimension, as the traditional role of both student and teacher changes. In fact these changes may not be classified as actual changes, rather as exploration and use of certain personal, cognitive or soft skills in the relationship between teaching and learning procedures. These skills are in great demand in today's labor market as they are fundamental in every sector of the real economy.

The correlation of MOOCs and soft skills

The term *skill* refers to the ability to do an activity or a job well, mainly due to practice (Cambridge Dictionary, 2020). So a skill is the learned ability acquired by training. Skills are usually classified into three main types such as personal skills, functional skills and knowledge-based skills. As job requirements are constantly changing, new knowledge, abilities, techniques and tools are constantly emerging. Thus a deeper study of skills and human capital could form a strong foundation for building sustainable economies that can also support productivity growth and secure quality jobs.

Typically common job skills today include leadership and management skills (coaching, motivation, problem solving, strategic thinking, decision making, etc.), professionalism skills (dedication, ethics, integrity, self-confidence, etc.), organizational skills (multi-tasking, time management, goal setting, strategic planning, etc.), team building skills (flexibility, communication, collaboration, etc.) and analytical skills (critical thinking, data analysis, research, etc.). Other taxonomies include skills that are divided in self-management skills, social intelligence skills and innovation skills. Yet the bottom-line of every taxonomy mainly lies in fundamental attitudes of the personal self. In fact most of these skills are not even new, they have existed in past years during the history of humanity, but nowadays evidence suggests that their importance is constantly increasing together with the majority of every day roles that actually require them. So another commonly accepted idea is that these soft skills are equally important if not more important than typical certificates in getting a job, in the recent demanding labor markets. This has been quite the same worldwide during the past years. In addition, the basic hard skills in demand include sufficient knowledge of at least basic technologies (office tools, instant messaging, dropbox and goggle drive, etc.). Soft skills such as effective communication (talking, listening, writing, body language) and problem solving are considered quite important as anyone would easily appreciate a calm and easy to talk to, person that finds solutions. Collaboration and teamwork is of equal importance, as it makes work productive and pleasant all together, bonding colleagues and clients towards the same goals. The multitasking ability is also vital, as the need to balance multiple projects in a daily basis is quite common. It requires full organizational skills and even the ability to shift gears at the drop of a hat by switching roles, projects and even careers. As social media has lately been an excellent marketing tool, offering remarkable ways of networking and communicating, being skilled in the effective, proper, professional and credible use of social media is also a necessity.

However, as mentioned above, the use of MOOCs in a successful way depends greatly on the quality of the educational procedures that would be implemented through MOOCs. This depends mostly on the ability and flexibility of all the stakeholders to adjust in a fruitful way. And that demands certain skills that are quite similar to the new soft skills in demand.

There have been many initiatives in teaching skills through MOOCs. For instance, *LifeSkillsMOOC* (India), with duration of 6 weeks, with 3-5 hours/week and start date: 01/2020 (<https://www.mooc4dev.org/lifeskills1>). The Course description includes the following *“In the age of complexity ... one must develop the capability to think, strategize, plan, execute and lead successfully ... Life skills are essential, desirable and vital in addressing current and future challenges ... Life skills bring tremendous refinement in professionals’ behavior, prepare them for the change and the way to approach their professional work, job market and finally their life...Life skills can offer more positive attitude and bring overall well-being ... The course offers flexibility ... The learner will learn from readings, videos, discussions with co-learners and instructors, meaningful exercises, quizzes, short assignments, etc ... Certification available for those who wish to complete all required exercises and quizzes ...”*.

Other initiatives include skilled teachers and instructors that create online courses shared in various pre-organized platforms with learners worldwide, such as *Skillshare* (<https://www.skillshare.com/teach>). Skillshare is a platform where teachers can share their skills, experience, tips and techniques online, grow their followers and thus earn some money. The platform supports the teachers with extensive suite of resources and responsive support in order to create classes that inspire. Classes include a combination of video lessons and a class project. They are pre-recorded with duration of 30-40 minutes with assignments that help members put their new skills in action. Quite similar to Skillshare is *Teachable* (<https://teachable.com/teach-online>), a user-friendly, powerful online course creation platform which integrates features of online classes, payment processing, student management, multimedia lectures, etc.

As it appears, learners and teachers are all in need of advancing their skills. In fact, online teachers are more or less students too, as their role becomes now more advanced and their previous position of authority is somehow fading. At the same time, students who are attending MOOCs’ courses are also called to change their way of the usual passive physical class learning to a new active one. So the need of refining and developing daily is demanding and constant. The basic soft skills that need extra attention are communication skills (pleasant, clear, focused and targeted), empathy (the excellent ability of putting oneself in another’s position), patience (to overcome anxious moments and handle easily the workload), time management, flexibility and collaboration. Such skills are not hard to develop through well designed MOOCs.

Moreover, another skill that appears to be cultivated through MOOCs is motivation. According to researches (Rezaei, 2017) there could be a significant difference between learning and motivation in students who participated in courses designed under their certain proposed model, compared to students who did not participate. Students, who participated in the particular research, appeared to have higher learning and stronger motivation.

In addition, similar researches on various topics have been conducted by the authors of the present paper, as they are well experienced in using MOOCs. Actually the most recent research includes two groups of 20 post-graduate students that participated in a skill-course. One of the groups attended a MOOC course and the other group attended the same course in its traditional form. Both courses contained exactly the same educational material and were conducted by the same instructors. The models used, derive mostly out of practical experience but they all have one thing in common, which is the segmentation of each topic and its illustration in various ways such as images, videos, graphs, text, animation, etc. Also the assessment part includes all the key elements of the topic with multiple variations in the ways that they are asked. As a result, the learner is frequently asked to give the same answer but in different formats, which appears to be very helpful in the personal learning procedures. During these researches, the conclusion is always the same. Participants of well-design MOOCs show positive changes in cognitive, behavioral and practical skills in a higher percentage than in traditional courses. It also appears that their will and mood to participate rise.

From this point of perspective, it might be concluded that certain well designed models that consider a wide variety of factors could influence the effectiveness of learning and motivation of MOOCs' users. It is quite possible that similar models can influence a wide range of other skills, resulting in an feasible way of developing and expanding soft skills in demand for today's labor market.

In this way, another issue that well-designed MOOCs could solve is the problem of skills mismatch. This refers to a discrepancy between the demand and supply of skills in the labor market, meaning that the skills that employers need are different from the employees' skills. This matter can actually lead to short or long term economic and social losses for individuals, employers and the society, as it can take different forms. For instance, macroeconomic skills mismatch relates to differences in skills between jobs on offer and the pool of unemployed along broad qualifications level, or specific skills shortages or skills mismatch on-the-job (European Commission, 2016).

Conclusions

Working on developing soft skills demand is a quite new and rather hard area for educators, instructors, designers and policy makers in the field of workforce development and in the field of education and training. Yet it is a matter that affects many sectors of everyday life like all levels of education, employment services, economic development agencies, social enterprises and of course the plain citizen and his/her welfare and prosperity. The past few years, more or less, a wide set of new skills in demand has been identified and the number is constantly become higher. The relevant literature on soft skills in demand is quite extended yet the strategies needed for incorporating soft skills in vital sectors of everyday life such as education and workplace are quite limited and more often than not are mainly theoretical with few exceptions.

According to the European Commission (2016), a high commitment to invest in skills upgrading and competence development throughout life is crucial to maintain a productive workforce equipped with relevant skills. This can be seen as an effective response to structural changes such as rapid technological changes, globalization and the implementation of effective active

ageing strategies. To retain continued skill development within jobs and to shield susceptible workers from skill obsolescence, it is necessary for European lifelong learning policies to maintain their commitment to learning and training.

Moreover, one way of accelerating economic restructure could be the exploration of the real potential of the human capital and the generation of innovative products and services. Of course this is easier said than done, yet it obviously needs the support of well-polished skills in abundance, mainly flexible skills that can adapt and shape the jobs of the near future ensuring occupational mobility.

Well-designed MOOCs could be a simple and effective answer to the idea of how to develop and promote soft skills in demand. In many ways, it is estimated to be a feasible task, provided that various model-based MOOCs are thoroughly created, tested, evaluated and distributed among all stakeholders. It could then provide the answers in many questions concerning effective teaching and learning, as detailed and promising design involves all kinds of analytical, technical, organizational, professionalism and team building skills. Just the effort alone, may be not for an extended period of time, would probably be the best teacher in teaching soft skills in demand, as it engages better harmonization and collaborated work to model and incorporate the complex interactions between demand and supply in labor markets, as well as integrating the human capital with strong skills that ensure prosperity and well-being.

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