

# HOW DIGITAL TECHNOLOGIES ARE REVOLUTIONISING THE TRAINING FUNCTION IN COMPANIES: AN EXPLORATORY STUDY OF A POPULATION OF MANAGERS ATTENDING A MOOC<sup>1</sup>

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## INTRODUCTION

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All economic sectors and all businesses are affected by digital technologies (Bower & Christensen, 1995), involving a process of gradual change or total transformation. This paper concerns the specific context of the introduction of French lifelong learning MOOCs in 2014. It analyses the way MOOCs challenge the objectives and practices of the training function in companies. Traditionally, employees in France receive training in their companies and the topic, content and format of courses is determined by the employer. The arrival of MOOCs is forcing in-company training departments to adapt their strategies and objectives, both at the organizational level (by creating COOCs<sup>2</sup>, incorporating MOOCs into their training programmes, making MOOC creation part of the company's employer image strategy),

and at the individual level (acknowledgement of MOOCs completed by employees outside the company, recognition of MOOCs in CVs). This paper analyses the need for in-company training functions to evolve as new digital tools such as MOOCs emerge.

Whatever our feelings about the speed at which new digital facilities have been introduced into the field of training, they have undeniably greatly increased in number, becoming more collaborative and even free to users (as is the case of MOOCs). This research takes the same approach as Doueihy (2011), who as a specialist of digital cultures explains that the digital world has become a "civilisation", as it changes our perception of objects, relationships and values. The aim of this paper is to focus more specifically on what motivates managers to attend a MOOC, and to analyse the way digital technology is transforming in-company training.

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<sup>1</sup> MOOC: Massive Open Online Course.

<sup>2</sup> COOC: Corporate Open Online Cours.

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## 1. HOW DIGITAL TECHNOLOGIES ARE CHANGING IN-COMPANY TRAINING

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Knowledge is central to the economy of the 21<sup>st</sup> century (Westerman, 2014). Traditionally, knowledge was acquired initially in the education system, at school and university, and later through further training in the workplace or from MBA or similar courses. MOOCs make knowledge available anywhere, at any time, for anyone (whether in initial education or further training). New practices have sprung up which cannot be ignored.

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### 1.1. Companies used to select the topics, schedule and content of training programmes

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When companies started to introduce training programmes for their employees, they analysed needs in terms of current and future skills, then on that basis drew up a list of specific courses to include in the company's general training plan. Training programmes were designed by HR departments according to their training objectives, the number of hours as stipulated in the law, and employee targets. The company-funded courses were organised internally or outsourced, and were subject to considerations of productivity, socialisation and employability.

#### 1.1.1. In-company training as a contributor of productivity

The first goal of in-company training is to provide employees with useful – or strategic – knowledge and skills for the performance of their current and future tasks. This is a productivity goal. The concept of training as an investment developed from the theory of human capital, which originated in the 1950s. This theory was proposed by Becker (1957) and further developed by Schutz (1959). It puts training at the heart of a company's performance, and is an extension of the neoclassical school of economics in that it rests on the premise that individuals make rational trade-offs in conditions of perfect information. The idea is that without training, the workforce is undifferentiated, and better training leads to better pay.

Becker (1957) believes that each worker is the owner of his or her personal capital, which comes both from natural abilities and from the education and training received at school and in the workplace. The worker's stock of intangible capital will increase or decrease over time depending on personal choices regarding investment in training. Each individual has to make trade-offs between work and training in a return-on-investment rationale where training is seen as a generator of extra income in the future. The salary is considered as the return on human capital, a payoff for investment in training. Schutz (1961) extended this theory and carried out research which identified five sources of production and improvement of human capital: one is in-service training (including apprenticeships) organized by companies.

#### 1.1.2. In-company training as a socialization process

The second goal of in-company training is team-building over a common project and values which identify the organization (Arrow, 1962). This is a socialization goal. In a paper summarizing the major theories of occupational training, Quenson (2012) points out that in-company training in France was not originally intended for all types of employees. It did not appear unprompted, nor was it the result of trade-union demands. It was in fact introduced by Christian activists who were “*searching for a social model offering a way out of the confrontation between workers and management which characterised the 1950s and 60s*” (Quenson, 2012, p. 20<sup>3</sup>) and mainly targeted middle management and engineers. Only from 1971, when training entitlements became enshrined in French law, was in-company training extended to all employees. The principle of “*further occupational training as a constituent part of permanent education*” was introduced as a means of promoting training for lower-skilled employees, so they might join the middle ranks of employees, with the underlying aim of peaceful industrial relations. This legislation was based on the theory of human capital: it was believed that a rise in skill levels would increase labour productivity and economic growth. The law identified companies as the main player in matters of further training.

Sociology has studied training practices through the work of Sainsaulieu (1974), who

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<sup>3</sup> All translations of quotations used in this article are the authors' own.

showed how training, as a factor of organizational cohesion, is central to socialization processes. Training brings together employees who are normally separated by the division of labour. This encounter transforms the roles of the different players, including power games and industrial relations, as it gives employees access to new resources. Through training seminars, Sainsaulieu argues, employees build up a social network which transcends hierarchical relations and the barriers between professional fields, and informal relationships develop. (An alternative interpretation would be to consider training seminars as places of judgement and comparison imposed on the staff.)

### 1.1.3. In-company training as a guarantee of targeted employability

Skills management has given a third goal to in-company training, the goal of enabling certain employees to increase their employability. The employees concerned by such training are selected on the basis of yearly interviews (required by French employment law), age, position, etc. Not everyone who applies will be accepted, but clearly this new focus on skills has shifted responsibility for training from the company to the employee. Employees are encouraged to take a proactive interest in the development of their own skills so as to gain adaptability and mobility (Garcia-Penalvo, 2008). This virtuous circle, based on learning, can only work if the individuals involved are motivated (Dijkstra & al, 2014). In 2005, Carré proposed a theoretical model for “learning readiness”, positioning the learner as an “entrepreneur of the self”. Carré believes that a new, person-centred culture of training is emerging. The beneficiaries of training must become “learning subjects”. More importantly, rather than discussing the influence of digital technologies on training, Carré advocates lifelong training and a necessary transition from occasional training to permanent learning. “*You do not remember what you have been taught, but what you have learnt*”.

## 1.2. Digital technologies are changing practices in the field of training

The introduction of digital technologies into training is not a recent phenomenon in France. It started about fifteen years ago with the first distance training programmes. Cristol (2014,

p.124) identifies three stages in the development of e-learning: the *industrialization-based model*, which aimed at producing standardized courses for very large-scale distribution, the *communication-media-based model*, which combined several modes of knowledge dissemination (TV, radio, serious games, internet, face-to-face learning, etc.) and the *interaction-based model*, which was made possible by the arrival of interactive media (video conferences, collaborative social networks, etc.). New channels have appeared, such as serious games, hybrid training courses, collaborative social networks, portals providing access to the content of free internal company training courses, MOOCs and COOCs. Digital technologies have given rise to an enormous number of facilities and systems (Garcia-Penalvo & al 2012), but they have also changed three fundamental factors: the relationship to time, the relationship to the group, and co-creation and cooperation.

One of the most striking changes brought about by digital technologies is definitely the *relationship to time*. Distance training and information-sharing intranet sites enable employees to decide the time of their training (during or outside working hours), and the medium (their computer, tablet or mobile phone). Digital technologies have introduced the concept of “nomadic” learning, requiring adaptations to traditional testing and assessment methods. Synchronous virtual encounters are still possible, but rare. As a result of the temporal freedom that comes with the digitization of learning, content is now broken up into very short sequences, and the visual aspect (video) is taking precedence over written text and speech.

The second change concerns the *relationship to the group*, which has become fundamental. Digital training ensures that knowledge will be preserved in internal or external communities of experts, wikis, collaborative social networks and forums. However, real-life experience in companies has shown that it is very difficult for employees to fully attend their chosen e-learning courses. Many organizations have thus decided to place all e-learning course participants together in the same room, so that they can share information, motivate each other and complete the course.

The third change caused by digital technologies relates to the co-creation and cooperation required for development of such training courses. Companies used to outsource preparation of face-to-face or hybrid training schemes, or prepare them internally when they had

appropriate departments. Digital technologies automatically bring companies to work together in a *spirit of co-creation and cooperation*. Even if they belong to different business sectors, they are no longer afraid of joining forces to design training programmes which can then be executed in each company either separately or jointly.

For a general understanding of this revolution in training practices that takes into account both longer-standing digital facilities and the most recent developments, we propose a two-axis model: one axis for the individual’s learning style, and the other for the spatial characteristics of the training course.

The first axis reflects what theories of learning define as different styles for reception and retention of information. A person is said to be a “rational agent” if their learning style is based on categorization, clarity of content design, and analysis. This type of individual prefers to learn about methodologies, frameworks, demonstrations and solutions they will try to apply in a

new context. Alternatively, a “social agent” has a more empirical learning style centered on interaction with other internal or external players who are interested in the same topics. Such a person will learn by “trial and error, or chance” through discussions with others. These two learning styles are not mutually exclusive and may complement each other.

The second axis highlights two opposing conceptions of the design of occupational training courses. In the first case, courses are designed in the company and intended solely for its own employees, while in the second, they are based on external resources that are usually available free of charge, in tangible form such as TED talks, YouTube videos, MOOCs, etc., or intangible form (Alrami & al, 2015; Asuncion, 2014; Gallagher & LaBrie, 2012), such as expert communities on social networks. In this model, these different types of training are considered complementary and not mutually exclusive.

**Figure 1. Complementarity of training courses in the digital age**

<i>The individual as a rational agent</i>			
<i>Training as a closed system</i>	Training modes: face-to-face, distance, serious games, etc.	MOOC	<i>Training as an open system</i>
	Wiki, blogs, online tutorials, SPOOC	Practice communities, and a future MOOCstore	

*The individual as a social agent*

This classification is not exhaustive, but in our view it reveals three processes of change. First, companies now have access, free of charge, to quality training which they can recommend to their staff. Next, they must adopt new learning tools based on the sharing of experience (such as wikis, tutorials, blogs, collaborative social networks, expert communities, etc.), which are constantly-updated operational sources of knowledge (although care must be taken not to disseminate strategic information). Finally, the focus of in-company training is shifting away from the creation of content for a specific audience, towards individual support for a wide audience and their specific personal training needs.

Beyond these changes, the companies that will most successfully negotiate their digital transition are companies which have given adequate thought to adjusting their training strategy and their skill requirements.

The HR function is instrumental in the digital transformation of organizations, not only because it needs to support all employees

in adjusting their practices and integrating into a digital culture, but also because it too needs to change. In addition to content changes, digital technologies in training should also be analysed from an economic standpoint like any HR practice (Cappelletti, 2012; Delery & Doty, 1996; Huselid, 1995; Savall & Zardet, 2015). Training systems incorporating new technologies (including MOOCs) can generate economies of scale and bring more employees to attend courses. They thus help to create value for the organization and develop its human capital. Past research has put figures to the value created by the digitization of training (Chaptal, 2008, p 23; Christensen & Eyring, 2011, p.276). In addition to figures that focus on specific practices, this theme must be examined in the light of the “70-20-10” model proposed by Lombardo & Eichinger (1996) who map out the performance of different learning styles and demonstrate that the lessons learned by successful and effective managers come roughly 70% from experience with tough jobs, 20% from people (mostly the boss), and 10% from courses and reading. It



would be interesting to reconsider the performance pyramid for the different learning styles by incorporating the teaching practices that symbolize the digitization of training. Digitization is challenging this model because it combines different forms of learning content (videos, quizzes, and face-to-face learning) in hybrid mode over a longer time period, which is good for rooting learning in the memory and effective appropriation. Employees using free digitized courses such as MOOCs show strong commitment and motivation for their training, and as Pfeffer (1996, p. 14) observes, “*The returns from managing people in ways that build high commitment, involvement, and learning and organizational competence are typically on the order of 30 to 50 percent, substantial by any measure.*” But individual commitment and a desire to learn using digital technologies are not enough. The relations between human resource management (HRM) and particularly the system for training and organizational effectiveness must also be developed in a constructive dynamic (Delery & Gupta, 2016).

The recruitment process now puts the training function and its new tools at the heart of this shift. Digital technologies have led to a huge increase in the variety of training modes and tools, such as serious games, gamification, hybrid e-training, and MOOCs, available in France since 2013 (in this paper we focus on MOOCs provided by higher education institutions). MOOCs are free online courses with no specific target audience, and sometimes lead to certificates or course certifications (Daniel & Uvalić-Trumbić, 2014). They were originally designed by American universities in 2012 and provided over the EdX and Coursera platforms. They arrived in France in 2013, spearheaded by FUN<sup>4</sup>, a French-language EDX platform set up by the French Ministry of Education. The study by Karsenti (2015) reports that 4,317 MOOCs are available worldwide, and more than 36 million people have enrolled on a MOOC. The average age of participants is 35. 20% of MOOC participants come from developing countries. 86% have more than one secondary education qualification, and 88% are already in work. The main actors are the American platforms (EdX, Coursera, Udacity). The principal French-language players are FUN (France Université Numérique), *Agence universitaire de la francophonie*, Neodemia, *franceTV education*, Sillages.info, Solerni, EDUlib, and

Openclassroom. The main portals or aggregators are MOOCList, European Multiple MOOC Aggregator, Moocivity, OpenupEd, Ocean, *Mooc francophone* and Open Education Europa. The annual survey by FUN (2015: 37 MOOCs) shows that 55% of users of French-language MOOCs are men, and 60% are aged between 25 and 50. 61% are in work, 12% are retired, 11% are looking for work, 13% are high-school or university level students, 23% are registered on more than 3 courses and 70% are French.

Due to the success of MOOCs as a learning tool, this “disruptive innovation” in the words of Bower & Christensen (1995) was very quickly taken up by companies, which developed COOCs (on their own, under cobranding with external providers, or as co-creations with other organizations) on topics of strategic importance for their own employees. The significance of the MOOC, the training device that is the focus of this research, revolves around three fundamental aspects. The first is *cost*, as MOOCs are free of charge (Nyoni, 2013). Therefore, when a company decides to design a MOOC for clients, it must decide whether to consider it as a marketing object for its brand image, or whether to develop it under a business model (with sales of related products, company certification, seminars, etc.).

Next comes the question of the MOOC’s *utility value* in the company. Topic, frequency, and specialization are chosen at the individual’s discretion. Anybody can attend a MOOC, without necessarily informing their employer. A new landscape of company relations is thus emerging, in which an employee can request that certificates of training obtained outside the company be formally recognized internally for the purposes of promotion, specific duties, or a bonus. This is a paradigm shift, since the training is no longer solely in the hands of the company, but now also in the hands of every employee, who can decide on the form and content of training followed.

Finally, MOOCs may represent the beginning of a *new activity* for businesses. If companies start providing MOOCs or SPOCs<sup>5</sup> with course certifications, it is quite likely that some of these courses will eventually lead to company qualifications with high added value on the labour market, just like Microsoft certifications. In other words, higher education may be “uberized” by companies transforming their own training functions.

<sup>4</sup> France Université Numérique

## 2. RESEARCH DESIGN AND DATA

In this context, the problem addressed by our research could be expressed as follows: “How does in-company training dispensed through new digital systems (MOOCs) contribute to the value of the HR function and human capital?” Three subsidiary research questions were used to structure the overall design of this research. The first concerns the learner profiles, the second their relationship with management and the third their motivation for registering and attending a MOOC.

### 2.1. Research methodology

The field of this study is a MOOC on management, called “*From Manager to Leader*”<sup>6</sup> provided by the CNAM, a higher education institution in Paris, France. The CNAM was founded in 1794 and is aimed at people with work experience, whether currently working or looking for a job. The CNAM was a pioneer in distance learning in the 1960s, when it produced science courses broadcast on television. Today it is the number one distance learning institution in France and the top French institution in terms of MOOCs produced (10 in 2015).

The “*From Manager to Leader*” MOOC was primarily aimed at managers. Available in both French and English, it was hosted by the international public French-language platform (FUN) and attracted 36,615 viewers between 15 February and 30 March 2014. The study reported here covers this period of time, but it is worth

noting that this MOOC attracted more than 63,000 users over the 2014 and 2015 seasons combined, making it the number one MOOC in France in terms of number of participants. A questionnaire for our study was put online at the start of the MOOC, with the objective of understanding who its participants were, and their motivations. They could complete the questionnaire at any time during the MOOC.

The people signing up for this MOOC came from 55 different countries, with ages ranging from 18 to over 65, but we only considered questionnaire responses from people who 1) worked in France and were therefore subject to French legislation regarding training, and 2) were over twenty years of age, to avoid including students still in the initial phase of their education. We also focused on the central target of this MOOC, managers, i.e. people who stated that they had management responsibilities. As we wished to examine their relationship with their workplace, we only selected people who claimed to be currently working. After cleansing the data, we were left with responses from 1,551 people. 39,9% of this adjusted sample were women, 71,7% had already attended courses in management, and 31,7% had gained their management position on the basis of their skills rather than a formal qualification.

The age structure of our study sample differs from findings in other research about Coursera (MOOCs@Edinburgh 2013–Report#1, 2013; Christensen, 2013) or HarvardX and MITX (Ho, 2014), which shows an average or median age of 28. In our sample and a survey by FUN, the average age of participants was 35 (Table 1).

Table 1. Age Structure for different MOOCs

“From manager to leader” MOOC		FUN		Edinburgh	
Age		6% missing data		Under 18	3%
21 - 25	0.1%	18-25	7%	18-24	21%
26 - 30	1.1%	25-35	21%	25-34	33%
31 - 35	7.8%				
36 - 40	15.0%	35-50	32%	35-44	13%
41 - 45	23.8%			45-54	8%
46 - 50	22.8%				
51 - 55	20.3%	50 - 65	26%	Over 55	12%
56 - 60	9.0%	over 65	8%		

<sup>5</sup> Small Private Online Courses

<sup>6</sup> “Du Manager au Leader”: a MOOC available on the FUN platform at [https://www.france-universite-numerique-mooc.fr/courses/CNAM/01002S02/Trimestre\\_1\\_2015/about](https://www.france-universite-numerique-mooc.fr/courses/CNAM/01002S02/Trimestre_1_2015/about)

In our sample, the percentage of female users (39.9%) is nearly the same as the proportion of female users of HarvardX and MITX open line courses for non-scientific topics. Like Christensen's results (2013) for Coursera, there are more male than female users of this MOOC.

Although MOOC studied here is open to managers and non-managers alike, we reach the same conclusion as Christensen (2013) and the Edinburgh Report (2013) regarding the participants' high levels of education.

**Table 2. Educational levels of participants in different MOOCs**

<b>"From manager to leader" MOOC</b>		<b>Edinburgh research</b>	
<b>BEP/CAP (French vocational qualifications that are below baccalaureate level)</b>	1.1%	Some additional training	3.8%
<b>Baccalaureate</b>	6.7%	Completed high school	13.2%
<b>2 years of higher education</b>	13.6%	College	13.2%
<b>3 years of higher education</b>	10%	Undergraduate university	30.1%
<b>4 years of higher education</b>	13.8%		
<b>5 years of higher education</b>	43.5%	Postgraduate university	40.2%
<b>More than 5 years of higher education</b>	11.2%		

The questionnaire comprised four major sections: data directly related to user characteristics, variables concerning the individual's position in their company (number of employees managed, length of time in management, career path). Operationalization of variables concerning the motivations for enrolling on the MOOC was based on various online questionnaires for MOOCs launched before February 2014 by French and English-speaking universities. We compiled questionnaires about the Edinburgh MOOC (the MOOCS@Edinburgh report, 2013), the "Découvrir la science politique" MOOC on the EdX platform (Schiffino, 2015), the Coursera MOOCs (Christensen, 2013), and the "Problèmes et politiques économiques: les outils essentiels d'analyse" MOOC released by

HEC Montréal on the EDUlib platform (Roy, 2015).

Finally, we asked questions about the "MOOCers" relationship with their firm: Had a request for training been turned down? Did they inform the employer they were following the MOOC? Were they going to inform their employer? Did they intend to apply in the near future for a master's qualification (which could mean the employee would stop working)? Were they thinking about a career change? These questions were not included in previous questionnaires for MOOCs launched prior to February 2014. Variables concerning the MOOCers' relationship to their company made up a non negligible share of the questionnaire.

**Table 3. MOOCers' relationship with their company**

<b>A way to get onto a master's course</b>	7%
<b>For a career change</b>	11%
<b>For career advancement</b>	77%
<b>Will inform the employer on completion</b>	57%
<b>The employer refused training</b>	5%
<b>Informed the employer at the outset</b>	18%

The research presented here is an exploratory study of types of MOOCers, without setting research hypotheses. Our aim was to find out who the registered MOOCers were: are they men or women? How old are they? What position do they occupy in their company? How many people do they manage? etc. We also wanted to understand what they want from a MOOC,

and the kind of relationship they have with their company, and with their training department.

To compare various groups of participants based on their demographic features, position in their company, the number of people under their management, the kind of relationship they have with their company and their training department, we performed several hierarchical

and non-hierarchical classifications based on the coordinates obtained from a Multiple Correspondence Analysis (MCA).

As the variables are categorical variables, we undertook an MCA (Beh, 2014; Greenacre & Blasius, 2006; Hoffman, 1986; Lebart & Saporta, 2014; Le Roux, 2010). Following the recommendations of Benzécri (1986), Ciampi (2005), Lebart & al (2006), and Saporta (2011), we used the correspondence analysis output (rather than the initial variables) as the input for a cluster analysis. This results in more consistent clusters.

The clusters identified result from a two-step procedure using both hierarchical and non-hierarchical automated classifications. First, we define the number of clusters by performing a Hierarchical Ascendant Classification (HAC) using Ward's criterion on the coordinates obtained from the MCA. This means that we used the Euclidean distance on coordinates obtained from the MCA. The algorithm used by the SPAD8.2 software is Ward, which is one of the most accurate methods when an indicator of Euclidian distance is used (Jolibert & Jourdan, 2011). It was necessary to eliminate modalities with too few observations, which could affect the robustness of the analyses as rare modalities, when shared by the same individuals, often determine the first factors of analysis. All modalities concerning less than 5% of the sample were eliminated.

Next, to consolidate the classification, a K-means clustering algorithm was applied, using the centre of gravity of the first cluster as initial centres (Lebart, 2006; Milligan, 1980; Kizilcec, 2013). Lu & al (2008) show that this approach needs less iteration time than standard approaches and performs better in terms of convergence speed and ability to reduce the impact of noise. It also allows us to benefit from the reliability of the K-means clustering method without having to arbitrarily specify the number of clusters.

With our data, the algorithm converges after five iterations. The clusters were defined not only using the demographic information, educational level, position in the company, and number of employees managed as active variables, but also using nominal illustrative variables such as the participants' motivation and their relationship with their company. In order to keep only the variables that were significant for the description

of clusters, we used the test values together with their associated probabilities. As this was an exploratory stage study, we applied a maximum threshold of 10% for significant illustrative modalities to characterize the groups.

## 2.2. Results

Three distinctive clusters emerged which we will arbitrarily call: junior managers (in charge of fewer than 10 people), middle managers (in charge of 10 to 30 people) and senior managers (in charge of over 30 people). These clusters were further broken down into seven sub-groups of managers. Three "junior manager" sub-groups (one consisting of predominantly self-taught<sup>7</sup> females, one with rather high qualifications, and one mostly male with above-average experience for the group), and one "middle manager" sub-group (young and predominantly male) signed up for this MOOC to achieve promotion, or for a career change – in some cases planning to study for a Master's degree. These four sub-groups make up 53.6% of our total sample. We now describe these four groups, as they are the ones that shed light on the employee's relationship with the company's training function.

The very first **group A**, which we call "**junior managers, predominantly young, female, and self-taught**" represents 10% of our sample. Most members of this group have been in a management position for less than ten years (70.5% of this group), and most are female (76.9%). They manage a rather small number of people – 42.6% of the group are in charge of fewer than five people (compared with only 17.6% of the whole sample). Although just over half the members of group A have higher education qualifications (53.3% of this group have a bachelor's or master's degree, or equivalent, compared with only 23.8% of all participants in the MOOC), most of them have had no formal training in management (84.6% of them had no management training in the state education system and 69.8% had none in a private institution). 85.9% of members of this group stated that their management position was due to promotion based on length of service in the company and skills rather than formal qualifications. 59.1% of people in the group are between 36 and 45 years of age (compared with 38.8% in the whole sample). 61.5% of this group

<sup>7</sup> We define as self-taught people who did not receive any training in management during their initial education or later from a private institution.



have “*cadre*” (official management level) status (compared with 45.7% in the whole sample). 20% of people who had been refused a course in management fall into group A.

**The motivations of group A** are varied. 66% of its members joined the course for purposes of career advancement ( $p \leq 0.01$ ) and to receive a certificate at the end of the MOOC ( $p \leq 0.01$ ). While one quarter of this group informed their employer at the beginning ( $p \leq 0.01$ ) and at the end of the MOOC ( $p \leq 0.01$ ), half will do so once the MOOC is completed ( $p \leq 0.01$ ). About one third of the group is following the MOOC to enhance their CV ( $p \leq 0.05$ ). A very small but statistically significant share of the group (6%) intends to use success in the MOOC to gain a place on a Master’s degree course ( $p \leq 0.1$ ).

**Group B** represents 13% of the sample. It is also in the “junior managers” cluster. We shall call it “**young junior managers, with qualifications<sup>8</sup> and some management training**”. 33.1% of people in this group manage 10 to 20 people (compared with 21.9% of the whole sample). They only took up their management positions relatively recently: 77.7% of the group have been managers for less than ten years. 82.6% of the group are aged between 31 and 40, which makes this the youngest of the seven groups defined. 70.3% have a qualification corresponding to five years of higher education, and for 41% of the group, their management position was achieved through formal qualifications (compared with 31.7% in the whole sample). 77.7% had already been formally trained in management, and 52.9% had had management training in a private institution. Just over half the group (55.4%) has “*cadre*” status (compared with 45.7% across the whole sample).

**The motivations of group B** are mainly career-related. A significantly greater share of members in this group than in the overall sample joined the course to enhance their CV ( $p \leq 0.01$ ) and obtain a certificate ( $p \leq 0.01$ ). Since they see the MOOC as a means of career advancement ( $p \leq 0.05$ ), these people did not inform their employers that they were taking the course ( $p \leq 0.05$ ), but intend to inform them when they complete it ( $p \leq 0.05$ ). Members of this group are uninterested in establishing contacts with other people to a significantly greater extent than the rest of the sample (socialization effect) ( $p \leq 0.01$ ).

**Group C** – 18% of the sample – can be described as “**experienced, self-taught junior managers**”. Members of this group are older

than the rest of the sample, with 57.1% aged between 46 and 50 (compared with 22.8% of the whole sample). These people have overwhelmingly (91,4%) been in management positions for over ten years. Nearly all of them gained their position as a result of their experience and skills (rather than formal qualifications). Half the group manages departments of 5 to 10 employees. 18.9% of people in group C manage 20 to 30 employees, while only 9.6% of the total sample is in charge of teams of that size. Three quarters of Group C are male, and 24.6% did not go into higher education after leaving school (compared with just 7.8% of the whole sample). Most had no management training in the state education system, but half did in a private institution.

**The motivations of group C** reflect a hope for advancement as a result of the MOOC ( $p \leq 0.1$ ). This group has not come to fight for its rights, as it is not motivated by the prospect of a certificate at the end of the MOOC ( $p \leq 0.05$ ). Group C members have fairly low qualifications, and do not intend to apply for a Master’s degree course ( $p \leq 0.05$ ).

**Group D, “self-taught middle managers”**, makes up 12.6% of the sample. This group largely includes what we define as middle managers: 39.2% of its members manage between 10 and 20 people, and 15.9% manage between 30 and 50 people (compared with 9.8% in the whole sample). For 98.4% of the group, their management position was gained through experience and/or skills rather than formal qualifications. The group is predominantly male (84,6%). These managers are poorly qualified: 64.8% of them have spent only two years in higher education. The overwhelming majority of the group (87.7%) have had no management training from the state education system. However, around half of them (53.5%) have received training in management from a private institution (compared with 47.2% of the whole sample). Group D are the youngest middle managers in our classification, 27% of the group being between 36 and 40.

**Managers in group D** joined the MOOC to enhance their CVs ( $p \leq 0.01$ ), for a career change ( $p \leq 0.01$ ), and/or to apply for a Master’s degree course in the future ( $p \leq 0.01$ ). They signed up for purposes of career advancement ( $p \leq 0.01$ ) and to gain a certificate ( $p \leq 0.01$ ). At the end of the course, these MOOCers hope to have broadened their professional vocabulary ( $p \leq 0.1$ ) and will inform their employers ( $p \leq 0.05$ ).

<sup>8</sup> By “qualified” we mean an educational qualification, but not necessarily in management.

**Table 4. Description of managers attending the MOOC**

	Junior Managers			Middle Managers	whole sample
	Young self-taught managers <b>GROUP A</b>	Young qualified managers with training <b>GROUP B</b>	Experienced self-taught managers <b>GROUP C</b>	Self-taught <b>GROUP D</b>	
	10%	13%	18%	12,6%	
<b>Years in management:</b> less than 10 years over 10 years	70,5%	77,7%	91,4%		24,4% 75,6%
<b>Age:</b> 31 to 35 36 to 40 41 to 45 46 to 50	20,5% 38,6%	42,5% 40,1%	57,1%	27%	7,8% 15% 23,8% 22,8%
<b>Sex</b>	F: 76,9%		M: 76,4%	M: 84,6%	F: 39,9%
<b>In charge of:</b> 4 people or less 5 to 10 people 10 to 20 people 20 to 30 people 30 to 50 people	42,6%	33,1%	52,5% 18,9%	39,2% 15,9%	17,6% 22,8% 21,9% 9,6% 9,8%
<b>Level of education:</b> no higher education higher education: 2 yrs higher education: 3 yrs higher education: 4 yrs higher education: 5 yrs	13,6% 39,7%	70,3%	24,6%	64,8%	7,8% 13,6% 10% 13,8% 43,5%
<b>Management training</b>	43,6%	77,7%	70,2%	60,2%	71,7%
<b>Training in management from an institution of French state education</b>	No: 84,6%	No: 90,5%	No: 83,9%	No: 87,7%	No: 69,8%
<b>Management training from a private institution</b>	No: 69,8%	Yes: 52,9%	Yes: 56,7%	Yes: 53,5%	Yes: 47,2% No: 52,8%
<b>Status:</b> lower-rank staff "cadre" status	7% 61,5%	55,4%			3% 45,7%
<b>Management position as a result of:</b>	Skills/experience 85,9%	Formal qualification 41%	Skills/ experience 96,4%	Skills/ experience 98,4%	Skills/ exp 68,2% Qual 31,7%

Whereas table 4 has the structure of the socio-demographic variables of the various groups, table 5 mentions for each group presented previously the motivations which animated them at the time of the inscription

to the Mooc. Only significant motivations are mentioned and preceded by one or more asterix according to their degree of significance.

**Table 5. Motivations of managers attending the MOOC**

Motivation	Junior Managers			Middle Managers
	Young self-taught managers GROUP A	Young qualified managers with training GROUP B	Experienced, self-taught managers GROUP C	Self-taught GROUP D
career advancement	yes*	yes**	yes ***	yes*
enhance CV	yes**	yes*		yes*
gain acceptance to a Master's	yes***	no**	no **	yes*
personal interest		yes ***		no*
get to know what a MOOC is				no*
get to know the CNAM	no*			
get to know the teacher	no***			no**
get to know a new field	yes**	no**		
gain a certificate	yes*	yes*	no**	yes*
as a refresher course		no*		
meet people		no*		
for a career change		no**		yes*
improve professional vocabulary				yes***
for pleasure			no**	no*
has informed employer	yes*	no**		
will inform employer at end	yes*	yes**		yes**

\*p≤0.01 \*\*0.01<p≤0.05 \*\*\*0.05<p≤0.1

The overwhelming majority of the sample (95.1%) did not join this MOOC for socialization reasons, in other words, the initial motivation of participants was not to meet other people. However, as the MOOC progressed, groups were set up on the forum, on social networks and during informal gatherings. This MOOC has now become a recognized community of managers from 55 countries in all business fields.

for completing a MOOC, junior and middle managers' aim to advance their careers, senior managers' interest in discovering new things) and also reveals some new points (certification is not sought for its own sake; the MOOC can be viewed as a refresher course) which may open up new areas of research in the future. Analysis of the results of this exploratory investigation reveals that MOOCs differ from in-company training courses along three major dimensions.

### 2.3. Discussion

This typological analysis confirms many of the observations from our literature review (the desire to get credit from HR departments

**Table 6. The three distinctive dimensions of a MOOC compared with traditional training courses**

In-company training	MOOC training
Contributes to company productivity	Contributes to personal fulfilment
Compulsory socialization process	Freely chosen socialization process
Promotes employability for a particular job or field	Promotes employability unrelated to a particular job or field

**2.3.1. Motivations that differentiate a MOOC from a typical in-company training course**

***Productivity versus personal fulfilment***

The results of this study show that the motivations declared by people attending a MOOC are focused on the individual rather than being dictated by the company’s productivity goals. In other words, MOOCs contribute to personal fulfilment. This is in line with the recent French law issued in 2014, which puts individual development at the heart of the system, supported by the *Contrat Professionnel de Formation* (Occupational Training Contract, a system in which anyone working earns entitlements to a certain volume of hours of training, and can apply to use them for the approved training of their choice). In-company training is aimed at developing skills useful for the company, while MOOCs focus chiefly on personal development and the individual’s personal career development plan.

***Compulsory versus freely chosen socialization process***

During in-company training courses, apart from the learning process, members of staff may make value judgements about one another (their colleagues or superiors). The situation is quite different in the case of MOOCs, which allows every individual to learn without being judged, for instance by using an avatar. Participants choose whether or not to interact with others, and can select contacts according to their field or position in the company; this is not possible with in-company training, where course attendants normally work in the same field.

***Promoting employability in the company’s specific field versus employability in any business field***

When employees attend an in-company training course, they develop their skills so as to become more efficient in their jobs and/or business field. MOOCs allow any employee to register, whether or not they inform their employers. 3% of the sample of “*From manager to leader*” MOOC participants wanted to take some training but were refused by their employers or a training provider. In this type of context, MOOCs can be a tool for career change.

This survey also raises the issue of how companies should address the new expectations of their employees. They need to reconsider the training function value chain, and also how to update the skills of managers in charge of training.

***Evolution of the training function: a new value chain and new skills***

A new value chain for in-company training functions must be envisaged. Due to the impact of digital technologies, the training function is experiencing three irreversible upheavals which must be taken into consideration for restructuring its value chain. The first is a change of *content*. The training function must incorporate free high-quality resources that are produced outside the company’s environment on an international level and are extremely efficient in terms of learning outcomes. At L’Oreal, for example, the training intranet includes links to TED talks, YouTube videos, the “*From manager to leader*” MOOC, etc. The role of the training function is to select the best free resources available. L’Oreal is currently experimenting with MOOCs, trying to make employees familiar with such courses, and wants to find out how much investment in company

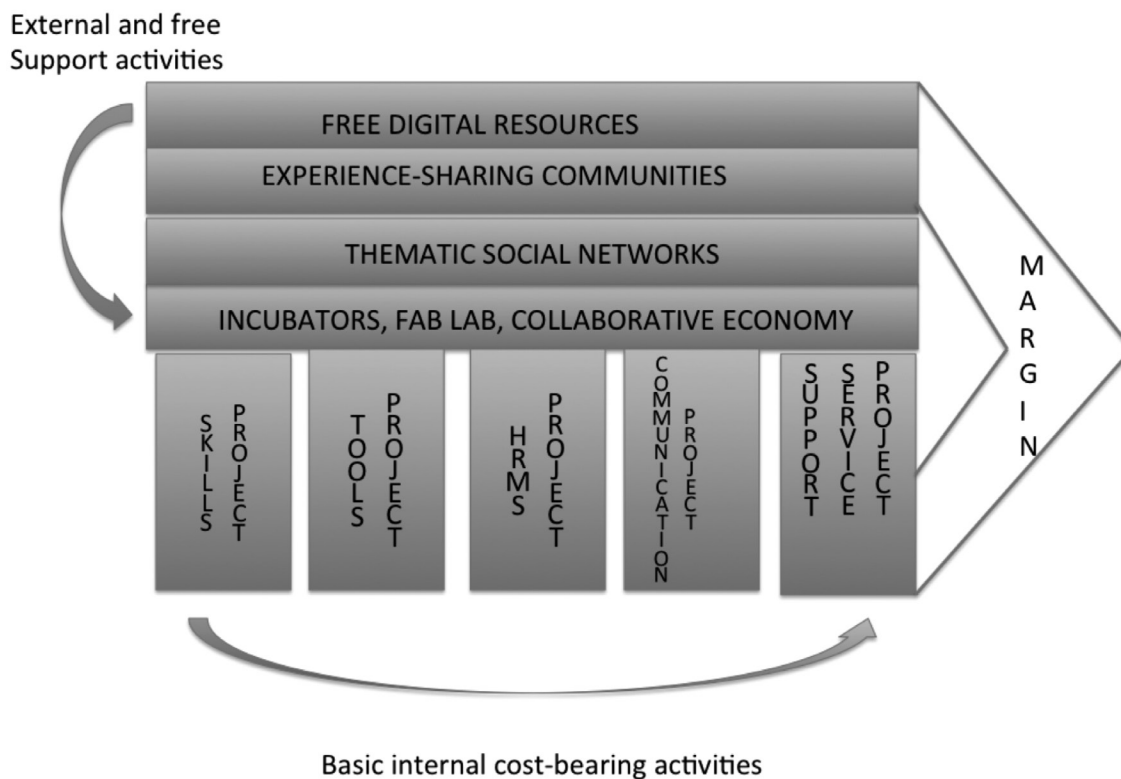


support is required. A first MOOC on “public speaking” was run on a voluntary basis, with extensive support from the training department – a kick-off meeting, periodic reviews, programme monitoring, etc. – and a second MOOC called “From manager to leader 2.0” is available internationally, with no support from the training department. The second change involves the *mode of socialization*: digital technologies are moving the boundaries of knowledge and skills development. It no longer makes sense to offer training programmes on a purely in-company basis, as employees expect the courses they attend to develop their personal networks both inside and outside the company. They want to exchange and share experiences asynchronously. The third and final change involves the *target*. Optimization of digital-based training resources will enable the training function to train many more people at the same cost, but with the focus more on individual support (defining a career development plan, for instance by ensuring consistency between MOOCs attended,

in-company training and independent learning on the platform’s collaborative social network) than on creation of content.

The added value of the training function in the value chain will be determined by two factors, firstly its ability to ensure consistency between external and free support activities, and secondly its ability to run and integrate five projects simultaneously to help the training function’s players develop new skills: a skills project (incorporation of new training tools such as COOCs, serious games, gamification, etc.), a tools project (user-friendly learning platforms including analytics tracking); a HRMS project (i.e. establishing a Learning Management System to incorporate all the resources into a single platform), a communication project (to communicate on this training function’s new focus on the individual rather than solely on jobs and skills), and a support service project (i.e. internal and external support for personal career development).

Figure 2. The training function value chain in the digital age



However, this in-depth change in the value chain will only come about if the players in the training field develop new skills.

### ***New skills to be acquired by people in charge of training***

Changes in company training systems are requiring training managers and other players in the field to rethink their roles and skills. This challenge is bringing out three fundamental questions. What new skills need to be acquired? What new model will underpin their added value, and how will it strike a balance between content creation, support for employees' career development projects, and the acquisition of IT skills? How can training departments optimize their employee support role in the company's digital transformation? The required skills will be technical (acquiring knowledge that can be applied to the design and maintenance of digital resources and training using those resources, learning to use social networks to set up communities, or acquiring gamification techniques) and behavioural (acceptance of errors, teamwork, ability to innovate in teaching methods), and involve an ability to learn (ability to manage, store, release and share information, as well as learning how to learn).

Companies that implement these changes both on a strategic level (reconfiguring the training function value chain) and an operational level (development of new skills in all people involved in training) will be able to address the new demands of their employees.

### **2.3.3. The training function needs to take new employee demands into consideration**

This paper reveals that managers attending the MOOC studied were clearly determined to take control of their own training, with personal development as their goal. Some of them would like their company to give formal recognition to their investment, while others prefer not to inform their employers. It is highly beneficial for a company to identify these groups, so as to offer them specific solutions by working with them on new kinds of training solutions, or determining what career development actions can be taken. In most companies, the role of training departments used to be to design specific content for targeted populations. In the future, it will be more about incorporating free training resources (TED talks,

MOOCs, etc.) into the company's own resources and supporting all employees in personalized training programs. It has been clearly shown that it is no longer the company, but the participant, who decides whether to take a course, what the content should be, and whether to inform the employer.

## **CONCLUSION**

The purpose of this exploratory study was to investigate how the relationship to knowledge is changing in companies in this digital age. The study has certain limitations which should be noted. The survey presented may not be generalizable to all MOOCs, but as regards employees it can be compared to lifelong learning MOOCs. Also, most of the respondents came from a single group of people who enrolled in one of the CNAM's 125 FUN courses. Other limitations relate to the study's exploratory nature. It gives a contextualized perspective on managers attending a MOOC at their own initiative, and it would be particularly interesting to compare the results to results for other MOOCs, conducted in English and on different topics. But despite its limitations the findings of this study open up interesting new avenues for research. The focus was on changes affecting the training function, using the motivations of managers attending a MOOC as our study field. We identified four groups of employees whose relationship with their company could be changed by their experience with the MOOC. This MOOC revealed new employee demands, which would be a good starting point for in-depth reflection on the evolution of the training function value chain, as well as the required changes to training management skills.

We agree with Elkjaer (2000) and Andreatos (2015) that intra-organizational continuing learning also needs to be reconceptualized in research about MOOCs. To take this research further, therefore, we designed another study including MOOCs in the Learning Platform System of international companies (Air France, L'Oreal, Safran, Ramstadt etc.) to reassess our first results. Another area for research would be to compare MOOC attendants' motivations, whether managers or non-managers, members of a firm or otherwise, seeking a formal qualification or not, with the motivations of learners who sign up as part of their required in-service

training. Zhenghao (2015), in a study of 780,000 people from 212 countries who had all completed a MOOC on Coursera in 2014, found that 72% of respondents said the experience had benefited their career and 61% reported educational benefits. In 2016 we launched a survey of 103,000 participants for the 3 seasons of the “From manager to leader” MOOC. The hypothesis tested is that while a participant initially registers for their own personal interest or out of curiosity, their actual experience of the MOOC may lead them to change their mind and make the completed MOOC a key factor in their “personal branding”, for instance by including it in a LinkedIn profile.

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**Appendix. Questions 30 and 31 on the motivations of MOOC participants**

**30. What do you want from this MOOC you have registered for?**

- To learn about a new field
- To find out about distance learning
- To try out a MOOC
- To learn more about the CNAM
- To find out about the teaching offered by the course leader
- To obtain a formal certificate of training
- To advance my career
- To enhance my CV
- To prove my worth as an applicant for a Masters at the CNAM
- To take a refresher course
- To meet new people
- For a career change
- To improve my professional vocabulary

**31. What was your motivation in signing up to this MOOC?**

- The possibility of obtaining a certificate of training
- Following a course that's entirely distance learning
- The reputation of the course leader
- The reputation of the CNAM
- I need to advance in my career
- Out of curiosity
- For the pleasure of learning

