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MOOCs at Work: What Induces Employer Support for Them?

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Abstract

Massive open online courses (MOOCs) are the learning technology with the fastest adoption rates in recent years, and they have the potential to transform corporate development practices. There is, however, only fragmented evidence on how employers use MOOCs. This paper relies on human capital theory to formulate hypotheses about the antecedents of employer support for MOOCs. It tests the hypotheses using data from a survey of MOOC learners and secondary data on the courses and on learners' countries. The results confirm that small employers that lack the scale to invest in in-company formal training are more likely to provide support for MOOCs than their larger counterparts, and that some organizations grant learners time off from work for MOOCs with not only core, but also non-core but still job-relevant content. Overall, however, employers fail to capitalize on low-cost MOOCs to compensate for a lack of formal training. On the contrary, what little MOOC support they offer goes to executives and full-time, rather than part-time employees.

Keywords: Training and development, online learning, human capital theory

Introduction

Investments into worker knowledge and skills are critical in an intensely competitive global economy (Farrell, 2012). Technological innovations and changes in the business environment increase the rate of skill obsolescence and force employees and organizations to regularly renew their skill base (Dill & Craft Morgan, 2017).

The most established way through which employees acquire new knowledge and skills is formal training: structured learning that takes place 'off the job', in a classroom or online (Manuti et al., 2015). The benefits of formal training include employee satisfaction (Zaleska & de Menezes, 2007) and increased job knowledge, job performance, and individual productivity, which translate into higher firm-level productivity (Zwick, 2005).

Yet the percentage of employees who receive employer-paid formal training markedly decreased, by 28 percent, in U.S. organizations between 2001 and 2009. The decrease took place in most occupational, age and job-tenure groups and cannot be explained by changing economic cycles and differing levels of economic prosperity (Waddoups, 2016). In the European Union, the participation rate in adult learning remains very low, with less than 6 percent of adults having undertaken any formal training and education programs in the prior 12 months (European Commission, 2018). Only a minority of EU companies report having received any financial incentives for their training activities (European Commission, 2018).

Massive open online courses (MOOCs) are the learning technology that has seen the fastest adoption rate in recent years (De Coutere, 2014), and they are predicted to become a major part of the learning environment in the future (Savino, 2014). MOOCs are online courses that are typically offered by elite higher educational institutions (88 percent of all MOOCs available are offered by schools within the top 50 in the university rankings of *US News and World Report*; see Shah, 2016), on a wide range of topics, at little or no cost. Since they pose no restrictions on participation (no prerequisites for formal accreditations or

degrees), they have a much higher number of participants, often in the tens of thousands, than traditional courses.

A large portion of MOOCs provide content that used to be provided in employer-sponsored formal training courses and that is suitable for professional development at the workplace. Since their inception, MOOCs as a group have shifted toward career-relevant content for learners who are in the workforce or want to join it; in 2018, subjects directly applicable to the workplace such as technology or business and management represented the two largest groups of courses and accounted for almost 40 percent of the course offering (Shah, 2018). MOOCs have the potential to transform corporate training and development practices as well (Farrell, 2012). Cascio (2014) predicts that the technology-delivered instruction that MOOCs are part of will boom in the next years, driven by forces both on the demand side (the rapid obsolescence of knowledge and the importance of relearning and lifelong learning) and on the supply side (increasing Internet access and bandwidth and advances in digital technologies).

MOOCs may present several advantages for organizations compared with face-to-face training courses. Their fees are lower and they do not require setup costs from employers. (On the other hand, universities and companies that create MOOCs incur production costs that range between 39,000 and 325,000 USD. Hollands & Tirthali, 2014). As courses are available from any device at any time, workers can choose their training hours, so their work day is less disrupted and they incur no travel costs. The courses may also provide some of the most valuable and cutting-edge training content produced by elite universities, which is often unavailable from local providers. Since most MOOCs are accessible on demand, they help with rapid knowledge acquisition. MOOCs also enable employers to provide development support in areas that are highly specialized or only indirectly related, but still beneficial, to learners' jobs (Hamori, 2018; Shah, 2018).

Despite the increasing importance of MOOCs in the labor market, empirical evidence on how employers integrate MOOCs into their training and development offering has been limited (for exceptions, see Castaño-Muñoz et al., 2016; Walton Radford et al., 2014). While studies provide data on the incidence of employers' awareness of MOOCs (Walton Radford et al., 2014), and on their support for MOOCs that are suitable for learning and development at the workplace (e.g., Castaño-Muñoz et al., 2016), the predictors of that support have remained unexplored.

This paper uses human capital theory (Becker, 1962) to examine the employee-, job- and organization-specific predictors of employers' likelihood of embracing MOOCs. In particular, it explores whether employers turn to low-cost and flexible MOOCs to make up for their lack of formal training practices, and to provide development for certain types of employees who tend to receive less formal training.

Theory and Hypotheses

The Literature on MOOCs

Despite the dominance of MOOCs that offer work-related content, there has been only little academic interest in analyzing how MOOCs may help corporate learning and development practices or influence labor market outcomes (Castaño-Muñoz et al., 2016; Olsson, 2016). Reviews of the academic literature on MOOCs (Gašević et al., 2014; Liyanagunawardena et al., 2013) reveal that most articles focus on the technological aspects of MOOCs, educational theory and the impact of MOOCs on higher education.

The literature on online training (for reviews, see Bell et al., 2017; Brown et al., 2012; Sitzmann et al., 2006) has compared online learning technologies with face-to-face instruction and examined the influence of individual differences and training design features on training outcomes. The conclusions from this literature are hard to generalize to the

research questions here, because the programs it studies are created and overseen by employers, while MOOCs are offered by third parties and are often used by employees without employer oversight.

MOOCs and knowledge acquisition at the workplace. The research that addresses how MOOCs drive professional and corporate learning represents a small body of literature, much of which is conceptual (Cascio, 2014; Clarke, 2013; Sreeleakha & Manikandan, 2014; Whitaker et al., 2016). The handful of empirical papers reveal that working professionals make up around 60 percent of MOOC participants (Christensen et al., 2013; Zhenghao et al., 2015), and that they enroll primarily to acquire job-related knowledge and skills (Christensen et al., 2003; Egloffstein and Ifenthaler, 2017; Milligan & Littlejohn, 2014, 2017). The majority of participants report that the MOOC did enhance their skills for their job (Zhenghao et al., 2015).

Most employers appear supportive of MOOCs: HR managers see no obstacle in the MOOCs being open courses where learners from different organizations come together and have the chance to share employer-related information (Olsson, 2016). Eighty-three percent of HR managers reported positive views on using MOOCs as a professional development tool (Walton Radford et al., 2014). Nevertheless, a mere 7 percent had started to use MOOCs for professional development at their corporation (Walton Radford et al., 2014).

Seventy-two percent of employed learners take MOOCs without their employer's awareness (Castaño-Muñoz et al., 2016). About 80 percent of the employers who are aware of learners' MOOC participation support MOOCs, although the bulk of their support involves encouragement, rather than cost reimbursement or providing time off to study. Encouragement increases learners' likelihood of completing the course, while time off and cost reimbursement were found to have no effect, probably because of the very small number

of employees receiving such support (in Castaño-Muñoz's study, 8 out of the 376 salaried learners surveyed received financial support, and 11 received time off to study).

In sum, despite the fact that MOOCs represent an increasingly dominant way in which employees gain job-related knowledge and skills, there is evidence from only a handful of empirical papers on how the courses are used. Except for that presented by Castaño-Muñoz and colleagues (2016), all of this evidence is descriptive, and it focuses on the incidence of employees' taking MOOCs for job-related reasons and the incidence of employer support, not on what causes these outcomes. While Castaño-Muñoz and colleagues did link employer sponsorship to course completion rates, researchers have not explored what types of courses and employees receive support and what types of employers sponsor MOOCs.

Hypotheses

To address these conceptual gaps, I look at the employee-, job- and organization-specific drivers of employers' support for MOOCs. I define employer support as any type of assistance from employers to employees who are enrolled in MOOCs, and I examine the most common types of support separately: tuition reimbursement (i.e., financial support or cost reimbursement for MOOC tuition fees) and time off to take MOOCs. These types of investments represent job-related 'inducements' that demonstrate employers' commitment to building long-term, rewarding employee relationships and increasing the desirability of current employment (Heavey et al., 2013; Tsui et al., 1997).

Employers invest in training practices out of rational cost-benefit considerations (Acemoglu & Pischke, 1999; Becker, 1962). They direct training investments at jobs, employees, or organizational units where they can obtain a high value added from training, either because such investments considerably increase productivity or because the resulting productivity increases represent huge benefits given the characteristics of the job, the

employee, or the organization. Employers also choose to invest in training if they are able to optimize training costs, making the benefits of training outweigh its costs. In this paper I apply the cost-benefit framework of human capital theory (Becker, 1962; Bishop, 1996) to make predictions about how employee-, job- and organization-specific factors drive employers' likelihood of investing in employee training and development via MOOCs. In particular, I ask whether low-cost and flexible MOOCs facilitate training and development for a broader group of jobs, employees and employers than formal training. Table 1 lists the differences between formal, in-company training practices and MOOCs provided by a third party, typically higher educational institutions. Since the analyses include MOOCs developed by a higher educational institution, Table 1 does not look at corporate MOOCs that provide firm-specific, custom-built content and are limited to the employees of the organization (Schwerer & Egloffstein, 2016). Table 1 does not include enterprise MOOCS either that provide firm- or product-specific knowledge and skills, but are open to anyone at or outside these firms (Schwerer & Egloffstein, 2016).

Insert Table 1 about here

Which employees receive MOOC support? As sections 1 and 2 of Table 1 indicate, while the development costs of in-company training sessions are high, requiring a large enrollment to make them worthwhile, MOOCs do not necessitate any upfront investment from organizations and have low costs compared to other types of formal training (Walton Radford et al., 2014). Indeed, the time that employees take from work to study in MOOCs represents the largest cost item for employers.

While training, in general, boosts job performance and employee productivity (Zwick, 2005) and generates positive employee attitudes towards the firm (Zaleska & Menezes,

2007), the cost of formal internal training is considerably higher than that of formal external training, seminars, or on-the-job training (Zwick, 2005). The significantly lower costs and greater flexibility afforded by MOOCs should enable employers to broaden the group of employees who receive training, in particular to those who were previously excluded for reasons of cost.

Hypothesis 1: MOOC support is more likely to go to employees who did not receive formal training in the past year than to those who were involved in formal training.

Employers channel investments towards those employees whose training may benefit the firm more. Jobs higher up in the organizational hierarchy typically confer greater responsibility on their holders, are more cognitively complex and require greater verbal and analytical skill (Altonji & Spletzer, 1991). In these jobs, human performance, and therefore training, has a greater impact on end results (Becker, 1962; Bishop, 1996). Furthermore, the job holder's existing stock of skills raises the benefits that come from additional training efforts (Lynch & Black, 1998). Although managers and executives make up only five percent of the U.S. workforce (Bureau of Labor Statistics, 2017), they consume between 32 and 35 percent of training budgets (Training industry report, 2012 and 2016). Training in managerial skills is the kind of developmental assistance most commonly provided in organizations (*Training,* 2016). Thus tight training budgets may prioritize training for those higher up in the organizational hierarchy. The low costs of MOOCs, however, may enable employers to offer development to more employees, including those in lower-level, non-managerial positions.

Hypotheses 2a: MOOCs enable employers to provide development opportunities to non-managerial employees.

Employers are also more likely to invest in formal training when they can get a return on the investment—for example, if they can ascertain that trained employees will not leave the firm and that benefits from training can be reaped over a longer time horizon (Becker,

1962; see also Waddoups, 2011). Therefore organizations tend to direct investments towards full-time employees, who are perceived to have a greater attachment to the firm. Part-time employees, even those with long tenure, are less likely to receive training (Arulampalan & Booth, 2004; Bishop, 1996; Estevez-Abe, 2005; Waddoups, 2016), even though training increases their organizational commitment and their treatment also affects the work-related behaviors and attitudes of full-timers (Way et al., 2010). The low costs and scheduling flexibility of MOOCs should help employers extend training to part-time employees.

Hypothesis 2b: MOOCs enable employers to provide development opportunities to part-time employees.

Which jobs receive MOOC support? Human capital theory suggests that firms are more likely to support training that has the potential to create greater job-related benefits, either by raising employees' job-related productivity or by increasing employee performance in jobs where human performance matters more (Acemoglu & Pischke, 1999; Becker, 1962; Bishop, 1996). Formal training sponsored by organizations tends to impart knowledge and skills that are highly relevant to the current job, because HR managers design and control training sessions (London & Hall, 2011; Salas et al., 2012). Indeed, organizations are advised to conduct a training needs analysis that specifies the critical task requirements and the knowledge, skills and abilities for these requirements in order to enhance the effectiveness of their training practices (Brown & Sitzmann, 2011; Salas et al., 2012).

As sections 3 and 4 of Table 1 show, MOOC platforms offer a broad variety of courses. While MOOCs that impart knowledge directly relevant to the core requirements of the learner's job are the most likely to get support from employers, the low costs and relative flexibility afforded by MOOCs may induce employers to support courses that develop broader competencies. Seemingly 'peripheral' knowledge or skills may still improve employed learners' day-to-day performance, because contemporary jobs increasingly blend

very different sets of skills and require knowledge from multiple disciplines (Burning Glass, 2017; *Economist*, 2017).

Hypothesis 3: MOOCs enable employers to provide training that addresses non-core, but relevant job content.

Which employers provide MOOC support? In an effort to optimize the costs and increase the benefits of training, organizations of different sizes invest in different training practices (Waddoups, 2012). Large organizations are more likely to provide formal in-company training because they benefit from economies of scale: for the same number of training hours, they incur lower costs per learner than their smaller counterparts (Miller, 2014). Large organizations also have more resources to develop formal in-company training (Lerman et al., 2004) and training on a wider variety of topics. Their lower labor turnover, a consequence of the higher wages they offer and the reduced labor market competition for their talent (Waddoups, 2012), makes large training investments less risky. Small firms are less likely to provide structured in-house training (Waddoups, 2011; Wooden, 1996). They provide more hours of external training and are also more likely to resort to tuition reimbursement than firms with over a thousand employees. In general, they tap into training opportunities that do not require significant internal resources to develop (Miller, 2014; Waddoups, 2011). The lack of setup costs and the low course fees of MOOCs provide an opportunity for small organizations and those that did not have the resources to develop formal training in the topic area of the MOOC, to embrace MOOCs in an effort to make up for their lack of training with this low-cost alternative. Their larger counterparts will be less likely to resort to MOOCs because they may already have development practices or organization-specific learning systems in place.

Hypothesis 4a: Small employers are more likely to provide support for MOOCs than their medium-sized and large counterparts.

Hypothesis 4b: Organizations that do not offer in-company training on the topic of a given MOOC will be more likely to provide support for that MOOC than those that already provide similar training.

Data and Methods

Sample

The analyses rely on three data sources: survey data from learners, secondary data on course characteristics and secondary, macroeconomic data on the countries where learners reside. First, the analyses use survey data from 2486 learners who took any of the 14 different MOOCs on a range of topics in the field of marketing (brand and product management, pricing, channel management, integrated marketing communications, etc.) offered by a top-ranked business school. I focus on MOOCs only in marketing (and not courses on history or art, for example) to ensure that the learners who join these courses do so for purposes of professional development. I collected data from learners rather than from their employers because although HRM managers may accurately describe the formal training programs offered by their company, they may not even know that employees are taking MOOCs. Between February and October 2016, I sent an email with a survey link to the 28,335 learners, right after these learners enrolled in any of the 14 marketing courses. The link was also accessible through the website of the respective MOOC. There were 2486 respondents, or 9 percent, a response rate similar to those from surveys of MOOC learners administered online (Christensen et al., 2013).

The mean age of respondents is 33 years. Fifty-five percent of them are male, and 86 percent have at least a bachelor's degree. The participants come from 127 countries, most of them from those that have the highest representation on MOOC platforms, such as the U.S.,

India, China and Russia. Since some of the MOOCs were offered in Spanish, other large groups of learners are from Spain, Colombia, Peru and Mexico.

Over 13 percent of the respondents are students, another 13 percent are self-employed, 12 percent are unemployed and others are retired (0.4 percent) or do not belong to any of these categories (1.7 percent). Fifty-three percent of the respondents are employed full time, while 7 percent are employed part time. Since the paper explores the drivers of employer support, the analyses focus on the 1481 full-time and part-time individuals. Of these, 39 percent work in marketing, 15 percent in sales and the rest in other job functions such as operations, IT or management.

The analyses rely on the databases of the World Bank (World Bank, 2016) and the Organisation for Economic Co-operation and Development (OECD, 2016), for macroeconomic data on the countries where learners reside, and the course platforms of the MOOC provider, for data on the courses (language of instruction, course length, number of modules, overall student satisfaction ratings etc.).

Since most variables come from the learner survey, I took several steps to minimize common method bias: guaranteeing respondents' anonymity, using survey items that ask about facts such as educational level or employment status as opposed to attitudes or perceptions, including simple, unambiguous questions and using varied scale formats (Podsakoff et al., 2003). Harman's single-factor test shows that a single factor accounts for only 11 percent of the total variance, well below the 50 percent threshold (Podsakoff et al., 2003).

Variables

Dependent Variables. The dichotomous variable *Support* takes the value of 1 if learners received at least one of the following types of support from their employer: cost

reimbursement or financial support for the MOOC, time off from work to do the MOOC, the employer organizing study groups for employees who attend MOOCs, the employer recognizing MOOCS in performance evaluation, the employer asking learners to participate in the MOOC and other types of support (cf. Castaño-Muñoz et al., 2016; Chattopadhyay, 2015). The information was collected with the following question: "Does your employer give you any support to participate in this MOOC? Please click every option that applies. (1) No support at all; (2) Financial support; (3) Time off from work to do MOOC; (4) Organizing study groups for employees who attend MOOCs; (5) My employer recognizes MOOCS in my performance evaluation; (6) My employer requested me to participate in this MOOC; (7) Other, please specify." Related constructs in the literature such as supervisory support (Chiaburu & Tekleab, 2005) or organizational support (organizational learning climate, Lim & Morris, 2006) are not applicable to this study because these constructs were created for employer-provided training. I also run regression models that predict, as dependent variables, the two categories of support that have the highest incidence of affirmative responses: *tuition reimbursement* (4.73% of the sample, 70 observations) and *time off from work* to study for the MOOC (8.04% of the sample, 119 observations). For formal, face-to-face training these two types of support typically co-occur: employers that pay for training also provide time off for employees. In the case of MOOCs, however, the two types of support do not necessarily go together: MOOCs are affordable so that learners can also pay for their own courses, and they are so accessible across space and time that learners can study outside regular work hours.

The other types of support are not used as dependent variables because fewer than 4 percent of the respondents indicated that they had received these types of support, so estimating these outcomes might have led to biased results. These variables are including MOOCs in learners' performance evaluations (3.74 % of the sample, 55 observations), study

groups for the MOOC (0.34% of the sample, 5 observations), employers asking learners to attend the MOOC (1.89% of the sample, 28 observations) and other types of support (1.09% of the sample, 16 observations). The most common answers in the latter category included employers providing encouragement, recommending MOOCs to employees, or providing Internet access.

Independent Variables. *Formal training* is a dichotomous variable where 1 signifies that the learner has received some formal training from the employer in the 12 months preceding the survey (Lynch & Black, 1998). *Hours of training* stands for the number of training hours that the respondent received from the employer in the 12 months preceding the survey (Waddoups, 2011).

To determine the hierarchical level of jobs, the questionnaire asked, 'What type of position do you work in? Please choose the option that best applies: nonmanagerial (1), managerial (2 [omitted]), executive (3)'. All three categories are dichotomous variables.

Part-timer is a dichotomous variable where 1 signifies part-time employees and 0 stands for full-time employees.

Core job content is determined through the question 'In which job function do you currently work?' The response options are accounting, administration, consulting, finance, human resource management, information technology, law, management, marketing, production/operations, R&D/engineering, sales and other (Cannella, Park, & Lee, 2008). Since all the MOOCs in the analyses address topics in marketing, it is assumed that they supply core job content if respondents work in marketing. Accordingly, *Core job content* takes the value of 1 for those who work in marketing and 0 otherwise.

The next two variables divide learners who work in functions other than marketing into two groups. Using a 1 to 5 Likert-type scale, the survey asked, 'How relevant is the topic of this course to your current job?' I create a dichotomous variable Relevant, non-core

job content, which takes the value of 1 if the respondent does not work in marketing but perceives the MOOC as 'very relevant' or 'extremely relevant' to his or her job. A second dichotomous variable, *Job-irrelevant content*, takes the value of 1 if the respondent does not work in marketing and perceives the MOOC as 'not at all relevant', 'slightly relevant', or 'moderately relevant' to his or her job.

Small employer is a dichotomous variable where 1 stands for organizations that have 50 employees or fewer. *Medium-sized employer* is a dichotomous variable where 1 represents employers with 51 to 1000 employees. *Large employers* (omitted category) is a dichotomous variable where 1 stands for employers with more than 1,000 employees. These categories follow the size definitions of the European Commission (European Commission, 2003).

Employer_training_topic is a dichotomous variable where 1 signifies employers who provide training on the topic of the MOOC. This information is collected with the question 'Does your employer provide training on this topic?'

Controls. Because the learners reside in 127 countries, I use several control variables to account for the fact that their location may influence the results. I control for the gross domestic product per capita (at purchasing power parity) of the country in which the learner resides (*GDP per capita*). I also control whether the learner's country is a member of the OECD (*OECD*), the group that includes the world's 35 most advanced economies (OECD, 2016). Both variables may affect learners' access to MOOCs and their employers' likelihood of investing in training and MOOCs.

Three course-level controls account for the fact that course characteristics may influence learners' likelihood of receiving support for a course. *Courses in Spanish* signify MOOCs that are imparted in Spanish (the omitted category is *Courses in English*). *Course length* is a continuous variable that signifies the number of course modules in each MOOC. Course length may influence learners' likelihood of choosing and completing courses

(Adamopoulos, 2013; Jordan, 2015), or employers' likelihood of supporting them. *Course rating* is a continuous variable between 1 and 5 that shows past learners' average evaluation of each course. *Course rating* may influence learners' likelihood of enrolling in a course (Adamopoulos, 2013), or employers' likelihood of supporting it.

Since women tend to have less stable career paths than men, employers might consider investments into training females less secure and profitable (Estevez-Abe, 2005). I therefore control for *gender*, using a dichotomous variable where 1 stands for male and 0 for female learners. Learner age may influence individuals' willingness to opt for MOOCs as a form of development, with younger learners more likely to enroll in MOOCs (Chuang & Ho, 2016). Learner age is also related to other antecedents of receiving development such as work experience, managerial level, or organization or job tenure. *Age* is a continuous variable.

Language fluency determines learners' ability to take courses in the language in which the MOOC is offered and their likelihood of receiving organizational support for such courses. The dichotomous variable *Fluent* takes the value of 1 if learners indicate that they are fluent in the MOOC language or are native speakers of it.

Learners who have taken MOOCs in the past may be more likely to join the focal MOOC as well, even without their employer's support. *No MOOCs* takes the value of 1 if learners had not taken any MOOCs before the focal course.

Work experience is a continuous variable measured in years. It was obtained with the survey question 'How many years of work experience do you have?'

Respondents' educational level is assessed by five dummy variables: *no degree*, *bachelor's degree*, *master's degree*, *professional master's degree* (such as an MBA [omitted]) and *Ph.D*. I use the five dichotomous variables rather than a continuous variable that signifies years of education because the relationship between educational level and

MOOC support is nonlinear: learners with professional master's degrees such as an MBA are the least likely to receive support from their employer.

Analyses

To test the hypotheses, I run binary logistic regression models with the dependent variable *Support* and also with two different types of support (*tuition reimbursement* and *time off* to study for the MOOC) as dependent variables. To guarantee robustness, the analyses were also run as probit models, which led to the same results. Since the 1481 learners are nested in 14 different courses, the standard errors are clustered by course. I ran a Hausman test to formally examine whether course fixed effects are preferred over random effects. Results confirmed that random effects was the appropriate modeling approach (chi2=7.66, p=0.865).

Results

Table 2 displays the means, standard deviations and correlations of the dependent and independent variables in the analyses. Seventeen percent of learners received some type of support from their employer. Five percent received tuition reimbursement for the MOOC, and 8 percent received time off to participate in it. These percentages are higher than those reported by Castaño-Muñoz and colleagues (2016), but they are still low considering that 67 percent of respondents report that they intend to use the knowledge gained in the MOOC in their current job and/or to advance their career at their current employer.

Insert Tables 2 and 3 about here

Table 3 displays the binary logistic regression models. Model 1 includes the control variables only, while Model 2 enters the predictors of *Support*. Models 3 and 4 include the predictors of the two different types of support: *Tuition reimbursement* (Model 3) and *Time off* (Model 4). Models 2, 3 and 4 have the same set of predictors, but different dependent variables.

Hypothesis 1 states that MOOCS enable employers to provide development to employees who did not receive formal training in the past year. This hypothesis is tested with two variables, one that stands for the mere presence of formal training (*Formal training)* and another that looks at the number of hours of formal training (*Training hours*). Contrary to Hypothesis 1, learners who received formal training during the 12 months preceding their enrollment in the MOOC are also more likely to get employer support for it. For the dependent variable *Support* in Model 2 of Table III, *Formal training* is positive and significant (β=0.98, $p<.01$); indeed, the odds ratio (2.61) implies that learners who received formal training in the past 12 months are more than two and a half times more likely to receive employer support for MOOCs than those who received no training at all. At the same time, the continuous variable *Training hours* is not a significant predictor of *Support*: if learners received formal training, the quantity of training they received does not influence their likelihood of receiving MOOC support. These results are robust across models with the dependent variables *Tuition reimbursement* and *Time off* (Models 3 and 4 of Table 3). In both of these models, the presence of formal training is an important driver of the different types of support, while the extent of the training (*Training hours*) is not.

Hypotheses 2a and 2b propose that MOOCs enable employers to provide development opportunities to employee groups that tend to receive less formal training: non-managerial and part-time employees. To test Hypothesis 2a I use two dummy variables: *Non-managerial employees* and *Executives*. The omitted category is *Managers*. While *non-managerial*

employees do not show any difference from the omitted category (*Managers*) in their likelihood of receiving *Support* (β=-0.02, n.s.), *Executives* are significantly more likely than *Managers* (β=0.43, p<.05) to receive *Support,* and they are much more likely than *Managers* (β=0.93, p<.01) to receive *Tuition reimbursement*. The odds ratio of 2.63 indicates that they are over two and a half times more likely to have MOOCs funded by their organization than managerial employees. Chi square tests reveal (Chi2=9.69, p<.05) that they are also significantly more likely than *Non-managerial employees* to receive *Tuition reimbursement*. Contrary to Hypothesis 2a, then, MOOC support in general, and tuition reimbursement in particular, are most likely to go to executives, while managers and non-managerial employees are both unlikely to receive support.

Similarly, part-timers are less likely to receive either *Support* (β=-0.47, p<.05) or *Tuition reimbursement* (β=-1.71, p<.10) for the MOOCs that they take than their full-time counterparts. Contrary to Hypothesis 2b, employers are not using low-cost, flexible MOOCs to extend development opportunities to part-timers.

Hypothesis 3 proposes that MOOCs enable employers to provide development in non-core job content. This hypothesis receives support in the case of *Support* and *Time off* to do the MOOC. Compared to the omitted category, *Job-irrelevant content*, both *Core job content* (β=0.77, p<.05) and *Relevant non-core content* (β=0.76, p<.05) are positively and significantly related to the likelihood of receiving *Support*, and Chi square tests show that the differences between *Core job content* and *Relevant non-core content* are not significant (Chi2=0.00, p=.95). Results with *Time off* show the same relationships: compared to the omitted category, *Job-irrelevant content*, both *Core job content* (β=0.95, p<.01) and *Relevant non-core content* (β=1.16, p<.01) increase the likelihood of receiving *Time off for MOOCs*, and there are no statistically significant differences between the two variables (Chi2=1, p=.32). At the same time, employers allocate *Tuition reimbursement* differently. Only *Core*

job content (β=0.76, p<.05) is a statistically significant predictor of *Tuition reimbursement*. *Relevant non-core content* is not, signifying that employers are willing to provide tuition reimbursement for marketing MOOCs only if learners work in marketing; that is, the MOOCs supply knowledge that is directly related to learners' core job content.

Hypothesis 4a proposed that small employers are more likely to provide support for MOOCs than their medium and large counterparts. This hypothesis receives support. Employers with 50 employees or fewer are the most likely to take advantage of MOOCs. They are significantly more likely to give *Support* and also *Time off* for MOOCs than employers with over 1,000 employees (*Support:* β=0.60, p<.01; *Time off*: β=1.03, p<.01). Small employers are also significantly more likely than mid-sized employers to provide *Support* (Chi2=6.30, p<.05) and *Time off* (Chi2=7.01, p<.01). Mid-sized employers do not differ from large ones in their likelihood of providing any type of support for MOOCs.

Finally, Hypothesis 4b states that organizations that do not offer in-company training on the topic of the MOOC will be more likely to provide support for MOOCs, in an effort to make up for their lack of training in this area. However, the results show that organizations that already offer training on topics similar to the topic of the MOOC are the most likely to provide *Support* for the MOOC, too (β=0.73, p<.05).

As for the control variables, the coefficient for *Professional master's* is negative and significant in all the models. Employers are the least likely to provide support to those who have already received formal education in business subjects. *Work experience* shows a positive linear relationship with *Support* (β=0.06, p<.05) and also with *Tuition reimbursement* (β=0.21, p<.01), suggesting that MOOC support is more likely to go to seasoned employees than to those who are just starting their career.

Differences in the antecedents of Tuition reimbursement and Time off. The analyses also explore whether *Tuition reimbursement* and *Time off* have the same antecedents.

Previous formal training (*Formal training*) from the employer is a significant predictor of both types of support. In addition, both are more likely to be provided to those who intend to acquire knowledge related to their *Core job content*. However, there are important differences in the predictors of the two types of support: part-time status (*Part-timer*) is not a significant driver of decisions regarding *Time off* (β=-0.19, n.s.), but it decreases the chances of *Tuition reimbursement* (β=-1.71, p<.10). While holding an executive-level position significantly increases learners' chances of getting *Tuition reimbursement* (β=0.93, p<.01), it is not a significant predictor of *Time off* (β=0.08, n.s.). Learners' years of work experience increase their chances of getting *Tuition reimbursement* (β=0.21, p<.01), but do not influence decisions about *Time off* (β=0.06, n.s.). While the likelihood of providing *Tuition reimbursement* to learners does not differ with organization size, the smallest organizations are the most likely to provide their employees *Time off* for MOOCs—more so than their mid-sized (Chi2=7.01, p<.01) or large (β=1.03, p<.01) counterparts. While employers are unwilling to provide *Tuition reimbursement* for *Relevant, but non-core content* (β=-0.07, n.s.), they are very willing to give *Time off* for such content (β=1.16, p<.01). Overall, these differences reveal that decisions regarding *Tuition reimbursement* are the ones that most closely resemble traditional decisions on formal training, in that executives, full-time employees and those acquiring knowledge related to their core job content are the most likely to receive this type of support. *Time off* is given by the smallest employers (i.e., those with the fewest resources to train their workforce) for MOOCs with both core and relevant non-core content, and to all employee groups in the organization, irrespective of their hierarchical level, seniority or full-time/part-time status.

Discussion

Theoretical Implications

Contributions to the literature on training. By looking at the predictors of MOOC support, this paper extends the empirical literature that builds on human capital theory foundations and compares employers' likelihood of investing in different types of training, such as generic and firm-specific training (Acemoglu & Pischke, 1999; Becker, 1962); formal in-company training and training by external providers (Waddoups, 2011); and different training topics such as computer, teamwork, or sales training (Lynch & Black, 1998).

The incidence of formal training and MOOC support. In accord with the hypotheses, which were based on the propositions of human capital theory, the results show that it is the smallest employers, those that do not have the resources to develop formal, in-company training, that take advantage of MOOCs, and that except for tuition reimbursement, MOOCs that develop non-core, but relevant job content do enjoy employer support. Nevertheless, many of the hypotheses were not supported. I reasoned that employers would capitalize on lower-cost MOOCs to compensate for their lack of formal training programs; but the results show that the employers that are the most open to integrating MOOCs into their learning and development portfolio are those that already invest in training their workforce.

It may be that for certain types of employers—such as those that experience rapid technological changes or mostly do knowledge-intensive work—constant learning is a competitive necessity, increasing the incidence of both formal training and MOOC support (Bishop, 1996). It may also be that companies that do not invest in training and development at all may not notice innovations such as MOOCs. And those employees who have been exposed to MOOCs may be less likely to bring this type of development to the attention of the HRM department because they doubt their employer's willingness to embrace any form of learning.

The employees who receive support for MOOCs. The hypotheses also proposed that employee groups that tend to receive less formal training would benefit from MOOCs. This

does not happen. There may be three reasons why executives are the employees most likely to receive support for MOOCs: First, executives in general receive more perks than lower-level employees, and these perks include reimbursement for all types of training costs. Second, the results may capture an early stage in the adoption of MOOCs by corporations, with executives piloting the MOOCs in order to decide whether they should extend this type of development to their teams. Third, since MOOCs require self-directed learning and grant a very high degree of autonomy and control to learners (cf. section 5 of Table 1), employers may be more likely to support learners they think will thrive under this regime: those high in general academic ability and with long work experience (Derouin et al., 2004).

Types of employer support. Both time off for the MOOC and tuition reimbursement represent job-related 'inducements', and the literature assumes that the antecedents of the various types of inducements are the same (Healey et al., 2013; Tsui et al., 1997). This is not the case. Decisions to grant tuition reimbursement depend mostly on readily observable learner characteristics: employees' job function, hierarchical position and full-time or part-time status. Decisions to provide time off, on the other hand, are based on worker needs for non-core, but job-relevant content. Finally, tuition reimbursement and time off from work are not granted together. Only 7 percent of the employers that grant tuition reimbursement and/or time off offer both. Future research needs to explore why the two types of inducements have different predictors.

Managerial Implications

While the majority of working professionals take MOOCs to gain knowledge and skills to do their job better (Christensen et al., 2013), only 17 percent of them get support for their course work from their employer, confirming that organizations lag behind in using

MOOCs for corporate development at a time when companies also invest less in face-to-face training (Waddoups, 2016).

The incidence of providing time off for MOOCs (8 percent) is much higher than the incidence of tuition reimbursement (5 percent), even though the actual costs of time off are higher than the low course fees of the MOOCs. This suggests that employers are not following rational cost-benefit analyses but simply reacting to the explicitness of the cost. Employers would be well advised to pay for certificates of course completion for more employees. Doing so may also increase the effectiveness of MOOCs: 74 percent of those who set out to earn an official credential complete MOOCs, compared to 9 percent of those who are not working for a certificate (Koller et al., 2013).

Thirty-five percent of employed learners in the sample (36 percent in OECD countries) received no formal training from their employer during the 12 months preceding the survey. These numbers are extremely high considering that most of the MOOC participants are highly qualified white-collar workers. MOOCs may help organizations without formal training practices to provide development at an optimal cost and with flexibility.

Limitations and Future Research Directions

This study samples 14 courses in a single discipline, marketing. While this approach helps eliminate underlying unobservable differences between courses in different disciplines that may bias the results, future researchers should try to corroborate these findings in studies of courses in various disciplines offered by several institutions (cf. Reich, 2015).

The paper looks at MOOCs provided by a higher educational institution. Future research could compare these MOOCs with corporate MOOCs that are only open to the employees of the organization that created the MOOC and include firm-specific, custom-built

content (Schwerer & Egloffstein, 2016). Future research should also look at employer support in enterprise MOOCs that offer firm- and product specific contents, but are open to relevant stakeholders (suppliers, customers, etc.) and to anyone else interested (Schwerer & Egloffstein, 2016). Since corporate and enterprise MOOCs provide firm-specific content, employer support for these two types of MOOCs may be higher and the range of participants broader than in the current analyses.

Several additional research questions did not fit the scope of this paper but should be addressed by future research. Future researchers should ask HR or L&D managers, and executives managing teams, why they choose to curate MOOCs (or not to do so). Studies should also examine the outcomes or consequences of support: What is the relationship between the various types of employer support for MOOCs and learners' probability of completing a course, their quiz scores, or their likelihood of transferring what was learned to the workplace, compared to outcomes for employees who enroll in MOOCs without their employer's awareness?

Conclusions

Young professionals will not only see major changes in the content of a single job, but also be expected to change jobs several times during their working life. MOOCs play an important role in life-long professional learning (*Economist*, 2017), but research in the HRM domain has not kept pace with that role. This paper demonstrates that decisions about MOOC support are based on old habits of thinking about who is "worth" educating, and it calls for making more rational decisions on MOOC support. It is one of the first to address how MOOCs are used for corporate learning and development. This type of research should continue in the future.

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Table 1. Differences between in-company training and MOOCs.

Training characteristic	Formal, in-company training (face-to-face and online)	MOOCs
1. Upfront investment	High upfront fixed costs to develop proprietary training materials (Waddoups, 2011)	No fixed costs for the employer
2. Return on investment (ROI)	Needs large number of employees trained to have acceptable ROI, because of high fixed costs (Waddoups, 2011)	Low fees per learner. Highest cost item may be the time learners take from work to study in MOOCs.
3. Barriers to join	Controlled by the employer: HRM professionals conduct a 'person analysis' to identify training needs (Salas et al., 2012: 82)	MOOCs do not require educational credentials, nor do they have high costs to enroll. The barriers to join are low, even if learners do not get employer support.
4. Training topics	Controlled by the employer: HRM professionals conduct job-task and organizational analyses (Salas et al., 2012: 81–82)	MOOC platforms provide a wide range of topics suitable for workplace development; many may be only indirectly relevant to learners' job content.
5. Training delivery	Controlled by employer: on employer premises, under employer oversight	Self-directed learning (Karakas & Manisaligil, 2012): employees may participate at any pace, from anywhere and at any time.

Table 2. Means, standard deviations and correlations of variables.

	Mean	S.D.	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20	-21	-21	-23	-24	-25	-26
1. Support	0.17	0.37	1.00																									
2. Tuition reimbursement	0.05	0.21	.49	1.00																								
3. Time off from work	0.08	0.27	.66	.09	1.00																							
4. GDP per capita	9.81	0.91	-.01	.07	-.04	1.00																						
5. OECD	0.44	0.50	-.00	.03	-.01	.69	1.00																					
6. Courses in Spanish	0.19	0.39	.00	-.03	.07	-.09	.05	1.00																				
7. Course length	4.66	0.94	-.04	-.05	-.02	-.05	-.03	.11	1.00																			
8. Course rating	4.51	0.29	-.01	-.05	.03	-.09	-.02	.40	.34	1.00																		
9. Gender	0.55	0.50	.00	-.01	.03	-.11	-.03	.06	-.03	-.02	1.00																	
10. Age	33.33	8.23	.03	-.02	.05	.22	.24	.06	-.02	.03	.12	1.00																
11. Fluent	0.86	0.35	.02	.02	.01	.10	.15	.10	.06	.06	.00	.04	1.00															
12. No MOOCs	0.34	0.47	.06	.04	.02	-.02	-.02	.06	.08	.03	-.09	-.12	-.05	1.00														
13. No degree	0.11	0.31	.00	-.03	.01	-.04	.01	.26	-.01	.07	.03	-.00	-.02	.07	1.00													
14. Professional master's	0.18	0.38	-.08	-.05	-.06	.01	.05	-.02	.01	.00	.13	.20	.11	-.05	-.16	1.00												
15. Master's degree	0.24	0.43	.01	-.01	.01	.12	.09	-.11	-.04	-.07	-.04	.06	.00	-.03	-.20	-.26	1.00											
16. Ph.D.	0.03	0.17	-.01	.02	-.02	.07	.08	-.06	-.02	-.03	-.04	.13	-.02	-.03	-.06	-.08	-.10	1.00										
17. Formal training	0.65	0.48	.15	.09	.07	-.00	-.02	-.03	-.02	-.00	.00	-.04	-.05	-.07	-.04	-.01	.01	-.02	1.00									
18. Hours of training	11.87	16.98	.11	.07	.06	-.01	.01	-.02	-.04	.01	.08	.02	-.01	-.03	-.05	.03	.07	-.02	.51	1.00								
19. Part-timer	0.12	0.33	-.05	-.07	-.01	.01	.03	.10	.01	.02	-.04	.01	-.02	-.02	.11	-.05	-.00	.01	-.08	-.10	1.00							
20. Non-managerial	0.29	0.45	-.04	-.03	-.05	.13	.13	-.15	-.01	-.08	-.07	-.14	.02	-.01	-.04	-.09	.05	.05	.02	-.04	.01	1.00						
21. Executives	0.18	0.38	.08	.07	.04	-.08	-.06	.06	-.02	.04	.05	.14	-.03	.05	-.04	.09	-.02	-.01	-.00	.06	-.07	-.30	1.00					
22. Work experience	6.60	2.50	.02	.03	.03	.20	.18	.03	-.02	.04	.13	.65	.07	-.16	-.01	.20	.03	.07	-.05	.01	-.05	-.15	.09	1.00				
23. Core job content	0.39	0.49	.06	.06	.02	-.08	-.09	-.08	.04	.00	-.12	-.04	-.03	.00	-.06	.03	-.06	-.03	-.05	-.12	-.08	-.05	.02	-.01	1.00			
24. Rel. non-core content	0.30	0.46	.07	-.02	.09	-.02	.02	.06	-.03	.03	.09	.04	.02	.01	-.00	.02	.02	.02	.02	.08	-.00	-.11	.09	.05	-.54	1.00		
25. Small employer	0.29	0.45	.07	-.04	.13	-.05	.02	.05	-.01	.02	-.04	-.05	-.01	.00	.16	-.14	-.01	-.05	-.14	-.09	.28	-.03	-.00	-.09	-.04	.06	1.00	
26. Medium employer	0.25	0.43	.00	.01	-.00	-.03	-.01	.05	.01	.04	.00	.07	-.03	.02	-.02	.06	-.03	.00	-.04	-.02	-.08	-.06	.11	.03	.12	-.03	-.37	1.00
27. Emp_Training_Topic	0.12	0.32	.14	.09	.07	-.03	-.01	.01	.01	.01	-.03	-.04	-.08	.06	-.02	-.02	-.00	.02	.17	.14	.04	-.04	.02	-.07	.06	.05	-.05	.01

Correlations greater than .05 or less than -.05 are significant at $p<.05$ or less.

Table 3. Logit regression models predicting support, tuition reimbursement and time off

	Support		Support		Tuition reimbursement		Time off	
	Coeff	s.e.	Coeff.	s.e.	Coeff	s.e.	Coeff	s.e.
Control variables								
GDP per capita	-0.10*	0.04	-0.01	0.08	0.65**	0.17	-0.24	0.20
OECD	0.00	0.16	-0.03	0.21	-0.30	0.34	0.14	0.26
Courses in Spanish	-0.15	0.19	-0.11	0.17	0.27	0.26	0.37*	0.16
Course length	-0.10*	0.04	-0.03	0.05	-0.27**	0.10	-0.07	0.06
Course rating	0.10	0.09	-0.12	0.13	-0.43+	0.24	0.01	0.18
Gender	0.10	0.12	0.07	0.14	0.02	0.16	0.23	0.21
Age	0.02**	0.01	0.00	0.01	-0.08**	0.02	0.02	0.01
Fluent	0.32	0.21	0.52*	0.24	0.88*	0.39	0.24	0.27
No Moocs	0.44**	0.12	0.46**	0.13	0.42*	0.20	0.23	0.20
No degree	-0.25	0.21	-0.16	0.15	-0.96	0.64	-0.30	0.32
Professional degree	-0.94**	0.25	-0.93**	0.24	-1.11*	0.44	-0.99**	0.35
Master's degree	-0.22	0.23	-0.25	0.21	-0.62*	0.25	-0.23	0.20
Ph.D.	-0.36	0.27	-0.24	0.48	0.05	0.73	-1.25	0.94
Predictors								
Formal training			0.98**	0.19	0.76**	0.20	0.69**	0.23
Hours of training			0.01	0.01	0.01	0.01	0.01	0.01
Part-timer			-0.47*	0.21	-1.71+	1.01	-0.19	0.28
Non-managerial			-0.02	0.22	-0.53	0.34	-0.07	0.26
Executives			0.43*	0.18	0.93**	0.27	0.08	0.21
Work experience			0.06*	0.03	0.21**	0.07	0.06	0.04
Core job content			0.77**	0.25	0.76**	0.25	0.95**	0.36
Relevant non-core content			0.76**	0.26	-0.07	0.32	1.16**	0.24
Small employer			0.60**	0.14	-0.32	0.39	1.03**	0.21
Medium employer			0.12	0.18	-0.13	0.45	0.37+	0.22
Employer_Training_Topic			0.73**	0.28	0.76	0.69	0.39	0.33
Constant	-1.56**	0.46	-3.43**	0.75	-6.87**	1.90	-2.87	2.41
Log Likelihood	-613.33		-542.28		-210.29		-333.03	
LR Chi2	27.73*		122.68**		77.75**		78.10**	

Notes: +p<.1, *p<.05, **p<.01; N=1309