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Self-directed learning in massive open online courses and its application at the workplace: Does employer support matter?

Monika Hamori

IE Business School, IE University, Alvarez de Baena 4, Madrid 28006, Spain

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ABSTRACT

This paper explores how employer support for self-directed learning in courses that are created and controlled by third parties (specifically, massive open online courses—MOOCs) influences employed learners' course performance, internal application of skills (their motivation to use the course content in their current job and organization, and their postcourse training transfer), and external application of skills (their motivation to use the courses to find a new job, and postcourse job search). While inducements (tuition reimbursement and time off from working hours) are negatively related to learners' external application of skills, they do not increase training transfer at the current employer after the MOOC, possibly because they fail to strengthen learner effort during the course. Expectation-enhancing support for the MOOCs (including the courses in performance evaluations, and requesting that learners take courses) does increase the internal application of skills, but also their external application.

1. Introduction

Professionals today need to redevelop skills every 12 to 18 months and acquire new skills throughout their working life, as jobs increasingly blend very different sets of skills and their content dramatically changes over time (Pelster et al., 2017). Yet the percentage of employees who receive employer-paid formal training has markedly decreased in U.S. organizations (Waddoups, 2016). The average number of training hours per employee dropped by about half in the U.K. between 1997 and 2012, especially among young workers and those in the lowest skill groups (Green et al., 2013).

MOOCs are large-scale online programs produced by higher educational institutions and large corporations and accessible through platform providers such as Coursera or Udacity. They represent an important recent development in the educational landscape (Ospina-Delgado & Zorio-Grima, 2016). Since MOOCs do not require a formal degree or other credentials for participation, can be taken at little or no cost by anyone with internet access, and offer the option of earning certificates or other credentials at a low cost to learners, they pose an alternative to university programs and cause significant disruption to higher educational institutions at a time when traditional higher educational institutions are considered increasingly unaffordable and ineffective (Deng et al., 2019).

MOOCs are a vehicle of lifelong learning: they provide an opportunity for employees to learn and relearn skills, complement formal training, or make up for the lack of formal training at organizations, representing an important channel for reskilling a workforce that needs to cope with ever faster technological changes and the resulting rapid decrease in the half-life of certain skills (Santandreu Calonge et al., 2019).

Employed "lifelong" learners represent an important audience of MOOC providers (Shah, 2018, 2020). Courses with content applicable to the workplace—those in business, management, computer science, and technology—constitute some of the largest groups of courses offered (Shah, 2018) and those with the most students (Shah, 2020). In certain professions (e.g., data science), MOOCs have become not only an important, but the major vehicle of skill acquisition (DeNisco, 2017). In organizations, the various types of nonformal learning that MOOCs offer account for up to 75 percent of learning (Bear et al., 2008) and act as an important substitute for or extension of formal training.

Despite the importance of MOOCs in employees' professional development, our academic understanding of this type of learning and its application at the workplace, lag behind. There are only a handful of empirical papers that explore how MOOC content is used at the workplace or which factors help or hinder its application. The extensive research on employer-provided formal training can give only limited insights, as professional development via MOOCs differs from formal training in several important ways. First, MOOCs are highly accessible

E-mail address: monika.hamori@ie.edu.

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and inexpensive, making it easy for employed learners to obtain job-related knowledge and skills without their employer's awareness. Only few employers are aware of or support their employees' acquisition of work-relevant content on MOOC platforms (Castaño-Muñoz et al., 2016). At the same time, the third parties (higher educational institutions, platform providers) that create and manage MOOCs have an important impact on employed learners' learning outcomes, and their course certificates may help learners move across employers. In sum, MOOC platforms provide training that is relevant to the workplace but may remain fully separated from employers.

This paper offers one of the few empirical analyses of employed learners' professional development in MOOCs. It asks the question: when work-relevant training is provided by a third party, does organizational support for it facilitate the application of the training content at the workplace? The paper examines three outcomes: (1) course performance; (2) learners' internal application of the knowledge and skills obtained from the MOOC: their motivation to use these skills in their current job or organization during the course, and their self-reported transferring of the MOOC content to the workplace afterwards; and (3) external application of skills: learners' motivation to use this content to find a new job during the course, and their self-reported job search behaviors after the MOOC. The external application of skills poses a much bigger threat for employers when the skills are learned on third-party platforms than when the employer provides the training, because employees enroll in courses for their own career development, not only for success in their current job (Egloffstein et al., 2019).

The paper contributes to several literatures. MOOCs that take over corporate training and development from employers are part of a paradigm shift in human resource management, in which human resource (HR) functions such as hiring or performance management, traditionally the tasks of HR departments, have increasingly been delegated to third parties or labor market intermediaries (Bonet et al., 2013). Our analyses explore the human resource management (HRM) interventions that align learners with organizational goals when training is provided by a third party.

The analyses also contribute to the literatures on training and training transfer. In their review of a hundred years of training research, Bell and colleagues (2017) propose that a critical issue facing future researchers is to better understand the unique features offered by mobile technologies and other emerging platforms and their impact on learning and transfer.

While there is an extensive literature on what organizational interventions facilitate training transfer after employer-provided formal training, several papers pointed out the limits of focusing only on formal training. They argued that the informal learning that occurs with or instead of formal training may significantly influence training transfer, and called for research that examines the transfer of other types of learning (Baldwin et al., 2017; Bell et al., 2017; Sparr et al., 2017). Although a few papers have explored how organizational interventions increase the effectiveness of nonformal learning and self-development at the workplace (e.g., Lejeune et al., 2018), these formats are different from MOOC-based learning as they always include a degree of employer oversight—for example, through personal development plans managed by the corporation. MOOCs, on the other hand, are developed and administered by third parties and enable employees to acquire professional content without any employer awareness or support (Castaño-Muñoz et al., 2016; Egloffstein & Schwerer, 2019). No research has explored the transfer of this type of learning.

This paper also contributes to the stream of research in labor economics that examines the group that most resembles the employed learners of MOOCs: employed "self-financed" learners who pay for their own training (Sauermann, 2006) and/or learn outside working hours (Kaufmann, 2015; Pfeifer, 2008). While this research has examined the relationship between self-financed training and job search intentions (Forrier & Sels, 2003; Green et al., 2000), job search behaviors (Green et al., 2000; Sieben, 2007; Veum, 1997), and job mobility (Dearden et al., 1997; Gerfin, 2004; Sieben, 2007; Veum, 1997), it has never addressed the application of the acquired skills at the learner's current workplace, nor organizational interventions that may influence such outcomes. Also, unlike MOOC participants, the self-financed learners in these papers represented a minority of employed learners, mostly attended face-to-face degree programs at vocational institutions or universities, and often studied content not directly applicable to the workplace (Kapsalis, 1996). Changes in the learning environment call for revisiting this literature.

Finally, the paper extends the small, growing literature directed at how MOOCs may be used to support corporate learning and development activities. Conceptual work (Park et al., 2018; Santandreu Calonge et al., 2019), interview evidence (Olsson, 2016; Walton Radford et al., 2014), and an employer survey (Garrido et al., 2016) show that employers have favorable attitudes toward MOOCs as a tool for professional development, although they also believe that face-to-face or blended training offers better opportunities to practice skills (Garrido et al., 2016). Yet only one paper examines the outcomes of employer support for MOOCs; it finds that such support increases course completion rates and the likelihood of earning a certificate (Castaño-Muñoz et al., 2016). Our current paper builds on this research by using a different typology of employer support and addressing yet unexplored outcomes such as training transfer and job search.

2. Theory and hypotheses

Although MOOCs are created and overseen by third parties and MOOC participants engage in self-directed learning (that is, they take the initiative in identifying their learning needs, formulating their learning goals, identifying learning resources, and evaluating learning outcomes [Knowles, 1975]), employers may still decide to curate MOOCs at the workplace by paying course fees, providing time for employees to take the courses, or requesting that they complete some (Castaño-Muñoz et al., 2016). Although participation in curated MOOCs retains most of the features of self-directed learning (for example, employees still take the initiative in identifying courses, decide on their learning strategies, and study at their own pace), it may compromise other features: limit the pool of courses that learners can take, or require learners to complete courses.

HRM practices reflect different forms of exchange relationships organizations have with their employees: different types of investments they make in employees and different behaviors they expect in return (Shaw et al., 2009; Tsui et al., 1997). Therefore, the support employers offer for professional development on third-party platforms may be of different kinds, too: Tuition reimbursement for MOOCs and providing employees time off to take courses represent "inducements." Like HRM practices such as above-market pay, generous benefits, and job security, this type of support demonstrates employers' commitment to increasing job desirability, conveys that the employer values its employees (Heavey et al., 2013; Tsui et al., 1997), and, through reciprocity norms, generates positive employee attitudes and behaviors towards the firm (Eisenberger et al., 1986).

On the other hand, including MOOCs in employees' performance evaluations or asking them to enroll in MOOCs convey employer expectations towards employees. Like pay-for-performance systems, employee monitoring, and performance evaluations, this type of support raises overall performance levels by focusing on what employers expect from employees and creates greater accountability for learning by placing greater demands on employees (Shaw et al., 2009; Tsui et al., 1997).

Previous theory and empirical evidence on inducements and expectation enhancements suggest that both should boost learners' course performance: expectation-enhancing support increases performance by placing greater demands on employees and instituting stronger systems of learner accountability (Shaw et al., 2009), while inducements do so by increasing employees' sense of obligation to learn skills that are

specific to the job and the organization (Eisenberger et al., 1986; Riggle et al., 2009; Shaw et al., 2009), and by evoking positive emotional responses such as organizational commitment, which has been shown to increase learners' motivation and effort (Colquitt et al., 2000; Facteau et al., 1995; Kontoghiorghes, 2004). The only empirical paper on the relationship between employer support and course performance (the number of courses completed), however, reveals that while in general support for employees' professional development activities on MOOC platforms boosted the number of courses they completed, its components—time off and tuition reimbursement—had no such effect (Castaño-Muñoz et al., 2016), perhaps because few learners received tuition reimbursement or time off. Despite these findings, and in accord with the previous literature on organizational support, I hypothesize that.

H1: Employers' course support in the form of inducements and expectation-enhancing support increases learners' course performance.

Course support in the form of inducements and expectation enhancements should also boost learners' internal application of skills: their motivation to use the MOOC in their job or at their workplace, and their training transfer after the course. First, as content relevance is a critical consideration behind corporations' employee development activities (Burke & Hutchins, 2007), support in the shape of either inducements or expectation enhancements is more likely to be provided to learners studying content that is directly relevant to their job or career at the organization. Relevant training content, in turn, increases learners' motivation to use these skills at the workplace as well as their likelihood of transferring this content to their job after the MOOC, because they see a closer relationship between training content and work tasks (Axtell et al., 1997; Burke & Hutchins, 2007).

Second, organizational support for MOOCs both in the form of inducements and expectation enhancements may coexist with other structures that support transfer of MOOC content to the job and organization: for example, several employees may take the same online course, facilitating knowledge sharing and the discussion of course takeaways; or the organization may nominate more advanced learners who help others during the course and facilitate the application of the course content in their work (Park et al., 2018).

Third, inducements are positively associated with learners' motivations to use the course content at the workplace because they increase learners' sense of obligation to contribute to the organization. A way in which such contribution may happen is learners using the course content in their current job and organization (Eisenberger et al., 1986; Riggle et al., 2009; Shaw et al., 2009). Expectation enhancements influence learner motivations to apply the course content on the job and employer in a different way, by creating a greater degree of accountability in learners through setting employer expectations and monitoring employee performance (Shaw et al., 2009; Tsui et al., 1997).

Finally, both inducements and expectation enhancements may relate positively to learners' training transfer after the MOOC through increasing learner performance and knowledge acquisition during the course (Blume et al., 2010; Carlisle, Bhanugopan and D'Netto, 2019; Facteau et al., 1995) and through motivating learners to use this content on the job and at the employer. The arguments above lead to the following hypotheses:

H2: Inducements and expectation-enhancing support are positively related to learners' internal application of skills: their motivation to use the MOOC content in their current job and organization (H2a), and their training transfer after the course (H2b).

While MOOCs may still have a negligible weight in corporate hiring decisions (except for technical and IT jobs [Banks & Meinert, 2016; Lerner, 2016; Rosendale, 2016; Walton Radford et al., 2014]), many professionals enroll in MOOCs with the objective of using the courses to find a new job (Milligan & Littlejohn, 2017; Zhenghao et al., 2015). The fact that MOOCs offer training content that is not specific to a single employer and that some platforms issue globally recognized course completion certificates increase this risk.

I expect, however, that support in the form of inducements will be negatively associated with learners' external application of skills: their motivation to use the MOOC to find a new job and their postcourse job search behaviors. Such support signals employers' willingness to invest in employees, and care and appreciation for them, and increases employees' perceived obligation and positive emotional responses to the employer (Cropanzano & Mitchell, 2005; Eisenberger et al., 1986). Consistent with these arguments, empirical research has shown that HRM inducements lowered the likelihood of job search and turnover because they signaled long-term employment possibilities and the employer's high commitment to employees, and decreased the attractiveness of other jobs in the marketplace (Riggle et al., 2009; Shaw et al., 2009). Perceived organizational support for development has been shown to correlate negatively with motivation to quit the firm, job search, and actual turnover (Koster et al., 2011; Kurtessis et al., 2017; Riggle et al., 2009). While training sponsored entirely by the employee significantly increased learners' mobility, employer-financed training reduced job search (Green et al., 2000; Hansson, 2008; Veum, 1997) and turnover (Dearden et al., 1997).

At the same time, expectation-enhancing support is likely not associated with learners' external application of skills. Since expectation enhancements represent a form of employer support for MOOCs, they may reduce learners' motivation to use the MOOC to find a new job during the course as well as their postcourse job search behaviors. Nevertheless, expectation enhancements might also increase learners' external application of skills through emphasizing what employees must give to organizations, increasing job-related demands, and reducing job control and autonomy. Indeed, researchers have argued that expectation enhancements might even increase voluntary turnover, but the empirical support for this possibility was weak: Shaw and colleagues (2009), for example, showed a positive effect only for poor performers, without any main effect, while Heavey and colleagues (2013) found only partial support for the positive relationship between expectation-enhancing practices and quit rates.

H3: Course support in the form of inducements is negatively associated with learners' external application of skills: their motivation to use the MOOC content to find a new job (H3a) and their self-reported job search behaviors after the course (Hy3b).

I test the hypotheses in three studies that include the same MOOCs, but different learner populations.[1] The survey for Study 1 was conducted when learners started the MOOC. It captures learners' motivations to use the MOOC content in their current job or at their current employer, or to find a new job. The survey was supplemented by data on learner performance during the course, recorded by the software of the MOOC platform provider. Study 2 retests two of the hypotheses (2a and 3a) tested by Study 1, with measures that were operationalized differently from those in Study 1. Study 3, based on data collected after learners finished a MOOC, examines learners' self-reported postcourse behaviors of using the MOOC in the current job or to find a new job.

3. Study 1

3.1. Sample and variables

3.1.1. Sample

Study 1 relies on data from three sources. Most of the variables come from a survey of learners who took one of 16 MOOCs offered by a European business school—all 4 to 6 weeks long, on a variety of marketing topics (brand management, pricing, etc.). The benefit of this sampling frame is that the courses are similar in both subject and length, and the learners who join these courses do so for the purpose of professional

[1] <2 percent of the respondents in Study 1 also filled in the survey for Study 3. There is no overlap between the respondents of Study 2 and the other two studies.

development. The survey, which individuals answered at the beginning of the course, asked them about demographic and career history data, and motivations to take the course. Between February and October 2016, I sent an email with a survey link to all 28,335 learners who started the 16 courses. There were 2486 respondents, or 9 percent, a response rate similar to that from surveys of MOOC learners administered online (Christensen et al., 2013). Since students, the self-employed and unemployed, and the retired cannot answer questions about the support they receive from their employer, I exclude them from the sample. Table 1 compares the motivation and course completion rates of these learner groups with those of employed learners. All the other groups have a higher motivation than employed learners to use the MOOCs to find a new job. Students are more motivated to earn a certificate, and the self-employed to start a new business, than employed learners. The various learner groups have similar course completion rates, with the exception of self-employed learners, who are less likely to complete courses.

The final sample includes 1355 individuals, employed either full or part time. The survey data are matched with participant activity data recorded by the software of the MOOC platform: the modules learners worked on and completed and whether they were working towards a certificate. Information from 346 learners can be matched with course performance data. Since the learners reside in 127 countries, I collected macroeconomic data on country of residence from the World Bank (World Bank, 2016).

3.1.2. Dependent variables

Learner motivations are captured with the question: "Why are you taking this course? Please click every option that applies" (Xiong et al., 2015; Zhenghao et al., 2015). *Use in job and organization* is measured on a scale that ranges between 0 and 2. The variable takes the value of 2 if the learner indicates that "I want to gain knowledge and skills to do my job better" and "This course will help my career in my organization." It takes the value of 1 if one answer is chosen, and 0 if neither. *Use to find a new job* is a binary variable that takes the value of 1 if the respondent indicates that "This course will help me find a new job at another employer" and 0 otherwise. The three options above are not exclusive; respondents may answer affirmatively to any of the three.

Course performance is measured with the percentage of the course modules completed, the aspect of learner performance that has received most attention in the MOOC literature, given the low course completion rates (Haug et al., 2014). The continuous variable *% course completed* ranges between 0 and 1, where 1 represents learners who completed 100 % of the course modules. For robustness, I operationalize course performance in five other ways as well. *% course worked on* represents the portion of the course that learners accessed, but have not completed. It ranges between 0 and 1, where 1 represents learners who worked on all of the course modules. The intuition behind this variable is that employed learners may be seeking not course completion but specific knowledge and skills that can best help them in their job. *Course grade* is the grade from the tests and quizzes learners took during the course. It is on a scale of 0 to 100 where 100 stands for the highest performance. I analyze the same variables not only at the level of the course, but at the level of the individual module as well: the binary variable *module completed* indicates whether the learner completed the module. The binary variable *module worked on* shows whether learners started the module even though they may not have completed it. *Module grade* stands for learners' score on a certain module, on a scale of 0 to 100.

Table 1
Comparison of the motivations and course completion rates of employed learners with those of other learner populations not included in the analyses: students, the self-employed, and the unemployed.

	Employed learners	Students	Self-employed learners	Unemployed learners
Learner intentions with the course (1)				
Earn a course certificate (as opposed to auditing the course)	0.26	0.38*** (3)	0.18**	0.30+
Start or improve own business	0.40	0.38	0.75***	0.39
Find a new job	0.32	0.20***	0.14***	0.43***
Gain knowledge to do current job better	0.60		0.42***	
Course completion (2)				
% of the MOOC completed	0.50	0.49	0.35**	0.44

Notes: (1): Percentage of learners indicating a certain intention. Since a single learner could indicate several options, the percentages do not sum up to 1.00.
(2) The difference between self-employed and employed learners is borne out in regression models. Self-employed $\beta = -0.10$, $p < 0.10$.
(3) T-tests compare the focal learner group with the reference group, "Employed." Stars represent the results of t-tests and indicate statistically significant differences between the focal and the reference groups. + $p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

3.1.3. Independent variables

The variables *Inducements* and *Expectation-enhancing support* were generated by the following question: "Does your employer give you any support to participate in this MOOC? Please click every option that applies. No support at all (1); Financial support (2); Time off from work to do MOOC (3); My employer recognizes MOOCS in my performance evaluation (4); My employer requested me to participate in this MOOC (5); My employer organizes study groups for employees who attend MOOCs [this variable is not included in any of the indexes, because only 5 respondents out of the 1355 in Study 1 indicated that their employer organized study groups] (6); Other, please specify: (7)." These items are based on studies by Castaño-Muñoz and colleagues (2016) and Chattopadhyay (2015), both of which looked at support specifically for MOOCs. *Inducements* is an additive index of two binary variables and ranges between 0 and 2. It takes the value of 2 if the respondent's organization has both of the following two practices: it provides financial support for the MOOC (pays the course fee or provides financial assistance in any other way) and grants time off to participate in it. It takes the value of 1 if it engages in only one of these practices and 0 if it engages in none. *Expectation-enhancing support* is an additive index of two binary variables and ranges between 0 and 2. It takes the value of 2 if participation in the MOOC is included in the learner's performance evaluation and the employer requests that the learner take the MOOC. It takes the value of 1 if the employer engages in only one of these practices and 0 if it engages in none.

3.1.4. Control variables

Certificate. When training and development are provided by a third party, employed learners' motivations and behaviors are influenced not only by the support received from their employer, but also by the support and structure provided by the MOOC platform. An important characteristic of the MOOC provider is whether it issues course certificates that verify that the learner completed the course. Haug et al. (2014) showed that certificates played an important role in boosting learner performance through increasing learner engagement and the time invested in learning. Certificates may also decrease learners' internal application of skills and boost their external application, through verifying the receipt of new knowledge and skills, communicating it to the labor market, and making individuals' competences more transparent, thereby facilitating their moves across employers (Dearden et al., 1997; Hansson, 2008; Sieben, 2007; Veum, 1997). *Certificate* is a binary variable where 1 indicates that the learner is working towards a

course certificate and 0 otherwise.

Since all the MOOCs address marketing topics, they may be especially relevant to those who work in marketing jobs, making these respondents more likely to use the content in their current job. The binary variable *Marketing* takes the value of 1 if the learner works in marketing, and 0 otherwise. This information is collected with the question: "In which job function do you currently work?" Response options are accounting, administration, consulting, finance, human resource management, information technology, law, management, marketing, production/operations, R&D/engineering, sales, and other. *Age* is a continuous variable that is measured in years. *Male* is a binary variable where 1 signifies men and 0 women. *Years of education* is a continuous variable; 12 stands for a high school education, 16 a bachelor's degree, 18 a master's, and 20 a Ph.D.

The analyses also control for attributes that may affect learners' chances of receiving organizational support. Managerial level is operationalized with three binary variables: *nonmanagerial*, *managerial*, and *executive* (omitted) learners. Employer size is operationalized with three binary variables: *small employer* (<50 employees), *medium employer* (between 51 and 1000 employees) and *large employer* (more than 1000 employees, omitted). *Work experience* is a continuous variable measured in years. *Part-timer* is a dichotomous variable where 1 signifies part-time, while 0 stands for full-time employees. To account for learners' differential ability to pay for the courses, differential access to MOOC platforms, and potentially different academic skills (Van de Oudeweetering & Agirdag, 2018), the analyses control for the Gross Domestic Product per capita at purchasing power parity (*Log GDP*) of the learner's country.

I checked for common-method variance in two ways. Harman's one-factor analysis revealed the presence of five factors with an eigenvalue greater than 1, the first factor accounting for only 14 % of the variance, well below the 40 % threshold. Common latent factor tests that compared the standardized regression weights of a model with and without the common latent factor showed that the biggest difference in regression weights was 0.09 (0.97 and 0.88, *Use other job*), well below the 0.2 threshold (Podsakoff et al., 2003).

3.2. Results

Study 1 tests Hypotheses 1, 2a, and 3a. Table 2 shows the means, standard deviations, and correlations of the independent and dependent variables. The respondents are nested in 16 MOOCs. Observations within the same MOOC may be more alike than observations in different courses, and standard analytic techniques that ignore this nesting effect may violate the assumption of observation independence (Huang, 2018). For this reason, I use course fixed effects models that take unobserved differences among courses into account, and I report robust standard errors where possible (Huang, 2018).

3.2.1. Hypothesis 1

Table 3 includes models predicting course performance. Hypothesis 1 proposes that inducements and expectation-enhancing support enhance course performance. The results are robust to the three different operationalizations of course performance: learners with *expectation-enhancing support* complete a higher percentage of the course ($\beta = 0.29$, $p < 0.01$ in Model 1 of Table 3), work on more of the course content ($\beta = 0.15$, $p < 0.10$ in Model 2), and earn a higher course grade ($\beta = 0.18$, $p < 0.05$ in Model 3), while *inducements* are not related to any of these three measures. Module-level analyses show that learners with expectation-enhancing support are more likely to complete a given module ($\beta = 1.55$, $p < 0.01$ in Model 4), are more likely to work on a given module ($\beta = 1.09$, $p < 0.01$ in Model 6), and earn a higher score on each module ($\beta = 0.15$, $p < 0.01$ in Model 5), while *inducements* are not related to these outcomes. These results provide partial support to Hypothesis 1.

Table 2
Means, standard deviations, and bivariate correlations, Study 1.

		M	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Use in job and organization	0.88	0.78	1														
2	Use other job	0.30	0.46	0.25	1													
3	Inducements	0.10	0.33	0.13	−0.04	1												
4	Expectation enhancements	0.05	0.23	0.10	0.02	0.22	1											
5	Age	31.66	8.56	0.04	−0.01	0.08	0.03	1										
6	Male	0.54	0.5	−0.02	0	0.01	0	0.09	1									
7	Years of education	16.42	1.83	0.05	0.06	0.01	0.01	0.28	0.02	1								
8	Work experience	6.96	5.58	0.08	0	0.09	0.04	0.78	0.1	0.22	1							
9	Part-timer	0.10	0.29	−0.01	0.04	−0.02	−0.02	0.07	−0.06	−0.02	0.02	1						
10	Marketing	0.31	0.46	0.25	0.02	0.1	0.07	0.09	−0.11	0.08	0.12	−0.01	1					
11	Nonmanagerial	0.38	0.49	−0.04	0.05	−0.06	−0.01	−0.13	−0.11	−0.03	−0.19	0.13	−0.07	1				
12	Managerial	0.44	0.5	0.04	0	0	−0.02	0.02	0.06	0.01	0.09	−0.08	0.06	−0.7	1			
13	Small employer	0.28	0.45	−0.01	−0.01	0.07	0	−0.04	−0.06	−0.18	−0.08	0.22	0.01	0.03	−0.03	1		
14	Medium employer	0.24	0.43	−0.01	−0.03	0	−0.01	0.04	−0.01	0.01	0.01	−0.06	0.09	−0.05	−0.01	−0.35	1	
15	Certificate	0.32	0.47	0.14	0.18	0.02	0.03	−0.09	0.1	−0.11	−0.08	0.05	0.01	0.02	−0.01	0.01	−0.02	1
16	Log GDP	9.73	0.92	0.03	0.03	0.04	0	0.27	−0.15	0.1	0.29	0.05	−0.01	0.13	−0.07	−0.03	−0.03	−0.09

Notes: Correlations greater than 0.05 or smaller than −0.05 are significant at $p < 0.05$. Correlations greater than 0.07 or smaller than −0.07 are significant at $p < 0.01$. N = 1355.

Table 3
Models predicting course performance.

	(1)	(2)	(3)	(4)	(5)	(6)
	% course completed	**% course worked on**	**Course grade**	**Module completed (0/1)**	**Module grade**	**Module worked on (0/1)**
Inducements	−0.0102	−0.0185	−0.0685	0.0509	−0.00856	−0.153
	(0.0653)	(0.0562)	(0.0626)	(0.205)	(0.0327)	(0.195)
Expectation enhancements	0.285**	0.151+	0.176*	1.547***	0.149***	1.093***
	(0.0987)	(0.0850)	(0.089)	(0.286)	(0.0444)	(0.267)
Certificate	0.576***	0.410***	0.147**	3.441***	0.375***	2.939***
	(0.0559)	(0.0481)	(0.0560)	(0.218)	(0.0285)	(0.201)
Age	−0.00188	−0.00268	0.00293	−0.00488	0.00261	−0.0114
	(0.00357)	(0.00308)	(0.00451)	(0.0103)	(0.00197)	(0.00959)
Male	0.0560	0.0493	−0.0359	0.219	0.0499*	0.198
	(0.0414)	(0.0356)	(0.0459)	(0.122)	(0.0234)	(0.117)
Years of education	−0.0153	−0.0119	−0.0175	−0.0921**	−0.0432***	−0.0902**
	(0.0110)	(0.00950)	(0.0134)	(0.0326)	(0.00668)	(0.0313)
Work experience	−0.00352	0.00627	−0.000299	−0.0723*	−0.0284***	0.0379
	(0.00596)	(0.00513)	(0.00710)	(0.0320)	(0.00611)	(0.0304)
Part-timer	−0.00410	0.0398	0.144	−0.00403	0.0628	0.226
	(0.0640)	(0.0551)	(0.0846)	(0.195)	(0.0401)	(0.183)
Marketing	−0.0286	−0.0537	0.00345	−0.0700	0.0376	−0.198
	(0.0425)	(0.0366)	(0.0485)	(0.130)	(0.0248)	(0.125)
GDP per capita	−0.0541*	−0.0569**	−0.0422	−0.310***	−0.0522***	−0.369***
	(0.0238)	(0.0205)	(0.0244)	(0.0709)	(0.0129)	(0.0685)
Cons	1.150***	1.276***	1.257***		1.756***	
	(0.282)	(0.242)	(0.317)		(0.158)	
N	346	346	135	1692	765	1699
R^2	0.276	0.217	0.112		0.219	

Notes: Standard errors are given in parentheses. Models 1 to 3 include course fixed effects. Models 4 to 6 include module fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.2.2. Supplementary analyses for Hypothesis 1

The structure and support provided by the MOOC platform, most importantly the course certificates that it issues upon course completion, substantially influence course performance; therefore, supplementary analyses compare the impacts of employer support (expectation enhancements and inducements) and course certificates on individuals' course performance. *Certificate* has a positive significant relationship with the proportion of the course completed ($\beta = 0.576$, $p < 0.001$ in Model 1 of Table 3), the proportion of the course that learners worked on ($\beta = 0.410$, $p < 0.001$ in Model 2 of Table 3), and course grade ($\beta = 0.147$, $p < 0.01$ in Model 3 of Table 3). Coefficient comparisons reveal that *certificate* is a statistically different, stronger predictor of course completion than either *expectation enhancements* ($F = 7.12$, $p < 0.001$) or *inducements* ($F = 40.94$, $p < 0.001$). It is also a statistically different, stronger predictor of *% course worked on* than either *expectation enhancements* ($F = 7.60$, $p < 0.01$) or *inducements* ($F = 29.57$, $p < 0.001$). Finally, it is a statistically different, stronger predictor of *course grade* than *inducements* ($F = 5.71$, $p < 0.05$).

3.2.3. Hypotheses 2a and 3a

Table 4 shows outcomes related to learners' motivations during the course: *use in job and organization* (Model 1), and *use to find a new job* (Model 2). OLS regression is used in Model 1, and logit regression is used in Model 2. Both models include course fixed effects.

Hypothesis 2a proposes that inducements and expectation-enhancing support are positively associated with learners' motivation to use the MOOC content in their current job or organization. This hypothesis receives support, as both *inducements* ($\beta = 0.243$, $p < 0.001$) and *expectation enhancements* ($\beta = 0.196$, $p < 0.001$) significantly predict *use in job and organization* in Model 1. *Certificates* also are positively related to *use in job and organization* ($\beta = 0.223$, $p < 0.01$), and there is no statistically significant difference between their effect and that of *inducements* ($F = 0.09$, n.s.) or *expectation enhancements* ($F = 0.11$, n.s.).

Hypothesis 3a proposes that inducements are negatively associated with learners' likelihood of wanting to use the MOOC content to find a new job. This hypothesis receives support, as *inducements* has a negative and significant relationship with *use in other job* in Model 2 of Table 3 ($b = -0.447$, $p < 0.05$). *Expectation enhancements* are not related to *use in other job*. *Certificate* is positively related to learners' motivation to use the MOOC to find a new job ($\beta = 0.965$, $p < 0.001$), and this positive relationship is stronger than the negative relationship between *job search*

Table 4
Models predicting learner motivations.

	(1)	(2)
	Use in job and org (OLS)	**Use other job (Logit)**
Inducements	0.243***	−0.447*
	(0.0394)	(0.185)
Expectation enhancements	0.196***	0.0746
	(0.0399)	(0.243)
Certificate	0.223**	0.965***
	(0.0540)	(0.132)
Age	−0.00666	−0.0162
	(0.00414)	(0.0117)
Male	−0.0398	0.0490
	(0.0379)	(0.126)
Years of education	0.00342	0.0572
	(0.00684)	(0.0399)
Work experience	0.00193	−0.0154
	(0.00381)	(0.0174)
Part-timer	−0.0334	0.112
	(0.0813)	(0.196)
Marketing	0.261***	−0.272*
	(0.0608)	(0.127)
Nonmanagerial	−0.0553	0.250
	(0.0516)	(0.186)
Managerial	0.0139	0.271
	(0.0636)	(0.179)
Small employer	−0.0278	−0.0830
	(0.0425)	(0.151)
Medium employer	−0.0624	−0.152
	(0.0496)	(0.154)
Log GDP	0.0171	0.0583
	(0.0282)	(0.0689)
Constant	0.840*	
	(0.293)	
R^2	0.064	

Notes: Course fixed effects are used. Standard errors are given in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5
Mediation analyses.

Effect	Coefficient	95 % conf. interval
Direct paths		
Inducements → Affective Organizational Commitment	0.531**	[0.362, 0.700]
Affective Organizational Commitment → Use in Job and Organization	0.112+	[-0.005, 0.229]
Inducements → Use in Job and Organization	0.180*	[0.039, 0.321]
Inducements → Use at Another Employer	−0.301*	[-0.537, -0.064]
Expectation-Enhancing Support → Perceived Accountability	0.432**	[0.139, 0.698]
Perceived Accountability → Use in Job and Organization	0.130*	[0.026, 0.234]
Expectation-Enhancing Support → Use in Job and Organization	0.130+	[-0.014, 0.273]
Indirect Paths		
Inducements → Affective Organizational Commitment → Use in Job and Organization	0.059+	[-0.006, 0.125]
Inducements → Affective Organizational Commitment → Use at Another Employer	−0.071+	[-0.143, 0.000]
Expectation-Enhancing Support → Perceived Accountability → Use in Job and Organization	0.0807*	[0.018, 0.143]

and either *inducements* (chi2 = 5.47, p < 0.05) or *expectation enhancements* (chi2 = 14.56, p < 0.001).

4. Study 2

4.1. Sample

To provide a different operationalization of the IVs and DVs in Study 1 as a check on robustness, and to test the mechanisms underlying Hypotheses 2a and 3a, I conducted a new survey of learners in the same marketing MOOCs in spring 2022. Upon enrolling in the courses, students were emailed a link to the survey. I received 280 responses, of which 141 responses came from employed learners. On average, the respondents are 37 years of age and have 16.6 years of schooling. 42 percent of them are male.

4.2. Measures

4.2.1. Dependent variables

Use in job and organization is a five-item scale that is based on the *training expectancy* scale by Hurtz and Williams (2009). Asked about their objectives with the course, learners had to indicate their agreement with five statements on a 1 to 5 scale (*strongly disagree* to *strongly agree*): I would like to use this course to…(1) acquire knowledge to implement in my day-to-day work; (2) gain knowledge that will help me perform my job better; (3) stay up-to-date on knowledge related to my job; (4) increase my chances for a pay raise at my employer; (5) increase my chances for a promotion at my employer (alpha = 0.71).

Use in another job is a five-item scale that uses items from the *training expectancy* scale by Hurtz and Williams (2009) and also adapts items from the *independent career orientation* scale developed by Gerber and colleagues (2009), as there were no previous well-established scales measuring learners' motivation to use course content outside the current employer or at a different employer. Learners had to indicate their agreement with the following items, on a 1 to 5 scale: I would like to use this course to… (1) help my career in the long run; (2) help further my personal development; (3) become employable in a range of jobs; (4) find a new job at another employer; (5) apply the content of this course at another employer (alpha = 0.74). All items are measured on a 1 to 5 Likert-type scale.

4.2.2. Predictors

As a check on robustness, I also operationalized the key predictors in Study 1—*inducements* and *expectation-enhancing support*—in a different way. While Study 1 simply asked learners to indicate whether or not their employer provided a certain type of support, this survey operationalized *inducements* and *expectation-enhancing support* as multi-item scales where respondents had to quantify their agreement with a statement focusing on each type of support on a 1 to 5 Likert-type scale. The five-item *inducements* scale includes the following items. (1) I receive tuition reimbursement from my employer for this course. (2) My employer pays for this course (cf. Benson, 2006; Pattie et al., 2006). (3) I receive paid time off for this course. (4) My employer provides me reasonable time off from work to do this course. (5) My employer has reduced my workload to participate in this course (cf. Bacon & Hoque, 2011). Alpha is 0.89.

The five-item *expectation-enhancing support* scale includes the following items: (1) My organization requested me to participate in this course; (2) I wanted to participate in this course out of my own interest (reverse coded) (cf. Salamon et al., 2021; Hurtz & Williams, 2009); (3) My employer recognizes this course in my performance evaluation; (4) My employer monitors my progress in this course; (5) My employer tracks the hours I am spending with this course (cf. Shaw et al., 2009). All items are measured on a 1 to 5 Likert-type scale. Alpha is 0.85.

4.2.3. Mediators

Accountability is a two-item scale, adapted to the MOOC context from the scale used by Konczak et al. (2000): (1) I am accountable for my performance in this course; (2) I am held accountable for my results in this course (alpha = 0.71). *Affective organizational commitment* is three items from Meyer and Allen's (1991) scale based on that of Dixon (2005): (1) I feel emotionally attached to my organization; (2) I feel a strong sense of belonging to my organization; (3) My organization has a great deal of personal meaning for me (alpha = 0.90). All items are measured on a 1 to 5 Likert-type scale.

4.3. Results

The results of the analyses that use the alternative operationalizations of the independent and dependent variables—shown in Table 5—are consistent with the findings in Study 1. Both *inducements* (β = 0.18, p < 0.05) and *expectation enhancements* (β = 0.130+, p < 0.10) are positively related to individuals' motivation to use the MOOC content in their current job or organization. *Inducements* are negatively related to individuals' motivation to use the MOOC content to find a new job (β = − 0.30, p < 0.05).

The paragraphs leading up to Hypothesis 2a argued that the two types of course support from employers affect learners' motivation to use the course content in their current job and organization in different ways: inducements influence this motivation through increasing learners' affective organizational commitment, while expectation enhancements do so through learners' perceived accountability. The analyses reported in Table 5 reveal that *inducements* have an indirect effect on *use in job and organization* (β = 0.06, 95 % CI [−0.06, 0.13]) through *AOC*, although the relationship is significant only at p < 0.10. The direct effect of *inducements* on *use at job and organization* (β = 0.18, p < 0.05) is significant, so that *AOC* partially mediates this relationship.

Expectation-enhancing support has a significant indirect effect on *use in job and organization* (β = 0.08p < 0.05, 95 % CI [0.018, 0.143]) through *perceived accountability*. The direct effect of *expectation enhancements* on *use at job and organization* (β = 0.130+, p < 0.10) is significant at the p < 0.10 level, so that *perceived accountability* partially mediates this relationship.

Inducements have a significant negative indirect effect on *use in another job* (β= −-0.071, p < 0.10, 95 % CI [-0.143, 0.000]) through *AOC*. The direct effect of *inducements* on *use at another job* (β = − 0.30, p < 0.05) is significant, so that *AOC* partially mediates this relationship.

Overall, these additional analyses show that the findings in Study 1, which showed significant positive relationships between both *inducements* and *expectation-enhancing support* and *use in job and organization* hold, even though the key constructs are operationalized in a different way. The analyses also provide support for the mechanisms proposed in the theory development: the mediating roles of *AOC* and *perceived accountability*. A considerable limitation of the additional analyses is the sample size, and the fact that the predictors, mediators, and outcome variables were obtained from the same survey.

5. Study 3

5.1. Sample

Study 3 relies on a postcourse survey of participants in the same 16 MOOCs. Data collection took place between June 2017 and May 2018. The survey, sent to learners two months after their course finished, asked learners about demographic and career history data, as well as about how they had used the MOOC content since finishing the course. 887 learners gave complete answers, and of those, 443 were employed either full time or part time. The analyses use data on this latter group. The survey data are matched with macroeconomic data on the countries in which learners reside.

5.2. Variables

5.2.1. Dependent variables

Learners' likelihood of using the MOOC in their current job is measured with a variable that asks respondents about actual behaviors they demonstrated after the course. The 3-item *training transfer* measure is adapted to the MOOC context from the perceived training transfer measure by Facteau et al. (1995). Representative items include "I incorporate knowledge and skills I learned in the MOOC into my daily work activities" and "I use the knowledge and skills I learned in the MOOC to help improve my job performance." All items are measured on a 1 to 5 Likert-type scale. Cronbach's alpha is 0.91. Learners' likelihood of using the MOOC to find a new job is captured by a variable that asks about job search behaviors after the course. The 4-item *job search* measure is shortened and adapted to the MOOC context from Blau's (1994) "job search behavior" index. Representative items include "I asked friends, relatives, or colleagues about possible future jobs that are related to the MOOC" and "I applied for jobs that required knowledge in the topic area of the MOOC." All items are measured on a 1 to 5 Likert-type scale. Cronbach's alpha is 0.87. Originally, *job search* had six items. Common latent factor tests, however, revealed that two of the items had a difference in standardized regression weights in the models with and without the common latent factor that was greater than the commonly accepted benchmark of 0.2 (Podsakoff et al., 2003): "I included the MOOC in my resume" (0.28, 0.50) and "I included the MOOC in my LinkedIn/Facebook profile" (0.32, 0.58). I have dropped these two items, and use four items that represent more intensive types of job search: looking for jobs, asking friends about jobs, applying for jobs related to the MOOC topic, and mentioning the MOOC in job interviews.

5.2.2. Independent variables

Inducements is a 2-item scale: "I received financial support from my employer to do the MOOC" and "I received time off from work to do the MOOC" (Cronbach's alpha = 0.69). *Expectation-enhancing support* is likewise a two-item scale: "My employer recognizes MOOCs in my performance evaluation" and "My employer requested me to participate in this MOOC" (Cronbach's alpha = 0.73) (cf. Castaño-Muñoz et al., 2016; Chattopadhyay, 2015). All items are measured on a 1 to 5 Likert-type scale.

5.2.3. Control variables

The control variables *age*, *male*, *years of education*, *part-timer*, *marketing*, *managerial level*, *employer size*, and *Log GDP* are all defined as for Study 1. *Certificate* is measured by a single item, "I earned a course certificate," on a 1 to 5 Likert-type scale (strongly disagree to strongly agree). *Organizational tenure* is the number of years the learner had spent with their employer at the time of taking the MOOC.

To ensure that common-method variance does not confound the interpretation of the results, I performed a common latent factor test, which revealed that the biggest difference in standardized regression weights in the models with and without the common latent factor was for *Certificate* (0.84 vs 0.93), still below the threshold of 0.2 (Podsakoff et al., 2003).

5.3. Results

Table 6 shows the means, standard deviations, and correlations of the independent and dependent variables. Table 7 shows models that predict outcomes related to learners' self-reported behaviors after the course: *training transfer* (Models 1 and 2) and *job search* (Models 3 and 4). As the learners are nested in MOOCs, I run models with course fixed effects to control for unobserved course characteristics that may influence learners' training transfer and job search, and report robust standard errors.

Hypothesis 2b proposes that both inducements and expectation-enhancing support are positively related to *training transfer*. This hypothesis receives partial support: while *expectation-enhancing support* is positively related to *training transfer* ($\beta = 0.137$, $p < 0.01$ in Model 2), *inducements* ($\beta = -0.082$, n.s.) are not. This nonsignificant result is robust to alternative specifications of *inducements* that enter tuition reimbursement ($\beta = 0.01$, n.s.) and time off ($\beta = -0.06$, n.s.) as separate variables.

Hypothesis 3b proposes that inducements are negatively related to job search. This hypothesis receives support. In Model 4 of Table 7, *inducements* have a negative and significant relationship with learners' *job search* after the course ($\beta = -0.157$, $p < 0.05$). Surprisingly, *expectation enhancements* are positively related to it ($\beta = 0.187$, $p < 0.01$).

Certificate is significantly related to *training transfer* ($\beta = 0.086$, $p < 0.01$) and *job search* ($\beta = 0.133$, $p < 0.001$). It has a stronger relationship with *training transfer* than inducements do ($F = 39.14$, $p < 0.001$), and its effect is not different from that of *expectation enhancements*. The strength of the positive relationship between *certificate* and *job search* is not different from the strength of the negative relationship between *inducements* and *job search*.

6. Discussion

This paper represents one of the first analyses of how the work-related knowledge and skills acquired on third-party course platforms are used at the workplace.

Expectation-enhancing support has a positive significant relationship with *course completion, use in job and organization*, and *training transfer*. These results are consistent with those in previous papers: just like pay-for-performance systems or performance appraisals, making MOOCs part of learners' performance evaluation conveys employer expectations about employee performance and increases learner effort (Shaw et al., 2009; Tsui et al., 1997). These relationships remain significant when *Certificate* is included in the regression models, signifying that expectation-enhancing support has an additional and different impact on these outcomes beyond the impact of certification.

While expectation-enhancing support is significantly related to both aspects of internal skill application (motivations and postcourse behaviors), inducements are positively related to learners' motivation to use the MOOC content in their current job and organization, but do not facilitate training transfer. One explanation is that although inducements elicit employee loyalty and commitment, they do not increase learner effort. The analyses of learners' course performance reveal that *inducements* do not affect course completion, the proportion

Table 6
Means, standard deviations, and bivariate correlations, Study 3.

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Training transfer	3.73	0.94	1														
2	Job search	2.96	1.11	0.28	1													
3	Inducements	1.77	0.98	0.03	−0.06	1												
4	Expectation enhancements	1.91	0.97	0.11	0.12	0.69	1											
5	Age	35.5	8.58	0.04	−0.15	−0.03	0.02	1										
6	Male	0.63	0.48	0.09	0.03	0	0.01	0.17	1									
7	Years of education	16.89	1.56	−0.01	0	−0.13	−0.12	0.21	0.05	1								
8	Organizational tenure	5.57	4.83	0.03	−0.13	0.04	0.11	0.67	0.16	−0.01	1							
9	Part-timer	0.13	0.34	0.04	0.13	−0.03	−0.04	−0.03	−0.02	−0.02	−0.11	1						
10	Marketing	0.4	0.49	0.08	−0.04	0.05	−0.01	−0.1	−0.11	0.06	−0.06	0.07	1					
11	Non-managerial	0.42	0.49	−0.06	0.07	−0.1	−0.06	−0.21	−0.16	−0.07	−0.17	0.17	−0.07	1				
12	Managerial	0.36	0.48	0.05	0.03	0.07	0.06	0.12	0.16	0.12	0.07	−0.14	0.06	−0.65	1			
13	Small employer	0.28	0.45	−0.01	0	0.04	0.07	−0.11	−0.09	−0.22	−0.12	0.25	0	0.01	−0.09	1		
14	Medium employer	0.36	0.48	0.1	0.01	−0.04	−0.03	0.04	0.02	0.02	0.04	−0.07	0.09	0	−0.01	−0.46	1	
15	Certificate	3.01	1.63	0.16	0.34	0.11	0.19	−0.07	0	−0.06	−0.02	0.07	0.01	0.01	−0.01	0.01	0.01	1
16	Log GDP	9.71	0.9	−0.14	−0.13	−0.03	−0.15	0.08	−0.12	0.04	−0.02	0.08	0.03	0.11	−0.08	0	−0.12	0.02

Notes: Correlations greater than 0.10 or smaller than −0.10 are significant at $p < 0.05$. Correlations greater than 0.125 or smaller than −0.125 are significant at $p < 0.01$. N = 443.

Table 7
OLS models predicting self-reported learner behaviors after the course.

	(1)	(2)
	Training transfer	**Job search**
Inducements	−0.0822	−0.157*
	(0.0555)	(0.0678)
Expectation enhancements	0.137**	0.187**
	(0.0466)	(0.0692)
Certificate	0.0855**	0.133***
	(0.0274)	(0.0299)
Age	0.00450	−0.0140*
	(0.00653)	(0.00712)
Male	0.0861	0.136
	(0.0939)	(0.102)
Years of education	−0.00212	−0.0138
	(0.0298)	(0.0327)
Organizational tenure	−0.00360	−0.0219
	(0.0111)	(0.0122)
Part-timer	0.0906	0.405**
	(0.139)	(0.151)
Marketing	0.208*	−0.106
	(0.0912)	(0.0994)
Nonmanagerial	−0.0425	0.120
	(0.119)	(0.130)
Managerial	−0.0138	0.110
	(0.119)	(0.131)
Small employer	0.0625	−0.223
	(0.120)	(0.131)
Medium employer	0.116	−0.00369
	(0.103)	(0.113)
Log GDP	−0.151**	−0.175**
	(0.0509)	(0.0552)
Constant	4.901***	4.887***
	(0.697)	(0.766)
R^2	0.095	0.158

Notes: Course fixed effects are used. Standard errors are given in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

of the course accessed by learners, or course grades, while *expectation-enhancing support* does, and *certificate* increases these measures still more. Overall, these results indicate that inducements fail to generate the same degree of accountability in learners as working for a course certificate or employers' expectation-enhancing support. These findings are consistent with those by Castaño-Muñoz and colleagues (2016) that while employer support overall significantly affected course completion rates, tuition reimbursement and giving learners time to work on the MOOCs did not. In contrast, previous studies found that inducements such as investments into formal, employer-provided training increased job performance by increasing employees' organizational commitment (Colquitt et al., 2000; Facteau et al., 1995; Kontoghiorghes, 2004)—perhaps because formal training gives learners more structure (a face-to-face instructor, set times for sessions), which, in turn, boosts course performance and training transfer. Future research should compare the relationships between inducements and transfer in formal training and in self-directed learning.

Hypothesis 3, which proposes that inducements decrease learners' external application of skills, is supported. *Inducements* are negatively related to learners' motivation to use the MOOC to find a new job and to their self-reported *job search*. These results match those in previous papers that showed that inducements are likely to increase employee commitment to the organization and decrease the attractiveness of other employers (Shaw et al., 2009; Tsui et al., 1997). But expectation-enhancing support increases *job search*. One explanation may be that learners who receive expectation-enhancing support acquire more content, as is evidenced by the higher course completion rates—content that, in turn, is also more likely to be used for job search. Another may be that, as Shaw et al. (2009) argued, expectation enhancements may put too many demands on employees and therefore increase the attractiveness of other employers.

Certification is a strong determinant of learner motivations and

behaviors, in accord with Dearden and colleagues' (1997) evidence that job search motivations, job search behaviors, and voluntary turnover increased when learners acquired skills on their own, through-self-financed training, and earned a credential. The positive relationship of certification with learners' motivation to use the MOOC in their current job and organization, and with their actual training transfer, is more unexpected; this relationship has not previously been theorized or empirically tested. It reveals that certificate earners have a mixed internal and external focus. The relationship between certification and training transfer may exist because learners receive a certificate only if they complete most of the modules and have test scores above a defined threshold. Certificate earners therefore may exert greater effort, complete more modules, and acquire more knowledge and skills than those not working for a certificate, increasing their chances of transfer. These results extend the literature on self-financed learners (employed learners who pay for training or study outside work hours), which for the most part has looked at learners' likelihood of using their new knowledge elsewhere (intention to leave, job search, turnover; e.g., Forrier & Sels, 2003; Green et al., 2000; Veum, 1997). Employed MOOC learners' transfer of this content to the current job is an important outcome that should be examined in future research.

The results above reveal that working towards a certificate is in many cases a stronger predictor of learners' internal and especially of their external application of skills than the HRM interventions used by employers, implying that future theoretical models of self-directed learning in online courses and training transfer need to consider the characteristics of the third-party provider, such as its ability to issue course certificates, its reputation, and the quality of the training it offers.

6.1. Contributions to theory

Contributions to the research on training and training transfer. This paper represents one of the first analyses of the transfer of knowledge and skills acquired in self-directed learning on third-party platforms. Reviews of the training transfer literature argue that informal learning that occurs with or instead of formal training may significantly influence training transfer, point out the limits of focusing only on the transfer of formal training, and call for research that simultaneously examines the transfer of formal and informal training (Baldwin et al., 2017; Bell et al., 2017). The results here are consistent with this proposal, as they highlight the particularities of online self-directed learning and invite more research on it.

The findings show that working towards a certificate is a strong, robust predictor of learners' internal and external application of skills, in many cases stronger than the HRM interventions used by employers. These results have important implications for the literatures on training transfer and self-directed learning. The literature on training transfer has looked at the conditions—learner characteristics, training design, and work environment—under which learners are most likely to apply the content of in-company formal training in their job (Blume et al., 2010; Burke & Hutchins, 2007). It has called attention to the importance of the supervisor's support, peer support, and transfer climate (Burke & Hutchins, 2007). The literature on self-directed learning has focused mainly on individual-level drivers; to the extent that it has looked at contextual factors, they have been mostly employer attributes such as opportunities for continuous learning (Rana et al., 2016), employer size, industry background, and the employer's learning and career policies (Raemdonck et al., 2012). The results here reveal that researchers also need to consider the characteristics of the third-party provider, such as its ability to issue course certificates. Other third-party attributes that could be considered by future research include the reputation of the MOOC platform, the reputation of the third party (higher educational institution or corporation) that developed the MOOC, the training methods used, and the quality of the training offered on the platform.

The training literature has examined the application of the course content mostly internally, at the workplace. Since the content offered by third-party platforms is generic human capital, the analyses here also examined its application elsewhere. The findings show that applying the content at the workplace and wanting to take it to another employer are not mutually exclusive outcomes; many employed learners simultaneously have both intentions. Similarly, a predictor's positive relationship with one outcome does not automatically imply its negative relationship with another. While certification is positively related to wanting to use the content to find a new job, it is also positively associated with use in the current job and in the current organization, indicating that certificate earners have a mixed internal and external focus, and even when they pay for their certificate themselves, using the MOOC content in their current job and organization is an important objective. Their actual transfer of this content to the current job is an important outcome that should be examined in future research.

6.2. Managerial implications

The results show that organizational support does influence learners' internal and external application of training provided by a third party. But the two types of organizational support benefit employers in different ways: inducements more effectively motivate learners to stay with their current employer than to actually *apply* their new knowledge in their current job. Expectation-enhancing support does increase not only course completion rates but also training transfer—though not necessarily at the current employer. Earning a certificate is the strongest predictor of course completion rates, and it also boosts training transfer, while its relationship with learners' motivation to use the course content in another job is stronger than that of either inducements or expectation enhancements; employers who plan to capitalize on MOOCs should take into account the structure and support provided by the MOOC platform.

6.3. Limitations and future research directions

The fact that all the MOOCs in the three studies are offered in the same topic domain facilitates the interpretation of results. Some of the results may differ in other types of online courses, for example in programming courses that issue certificates that are very highly valued by future employers (e.g., Google's developer or cloud certification on Google Open Online Education).

Many of the variables used within each set of analyses in the three studies were collected at the same time. Since the learner populations differed across the studies, matching the responses from the studies was impossible. The literature would benefit from multiwave surveys collected at the start of the MOOC and after its conclusion.

Although theoretical arguments contend that individuals learn new knowledge and skills if they participate in or complete MOOCs, my data could not capture whether actual learning took place; instead, I had to resort to proxy measures of learning such as the proportion of the course material that learners worked on and completed or the grades they received.

7. Conclusions

This paper represents one of the first analyses of a learner population whose prevalence is increasing in the contemporary workplace: employed learners who study in easily accessible, low-cost, modular online courses, and acquire knowledge that may be directly applied to the job, from platforms that are run by third parties and not controlled by the employer. The findings call attention to the importance of this type of learning and invite future research on it.

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CRediT authorship contribution statement

Monika Hamori: Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Monika Hamori is Associate Professor at IE Business School (IE University) in Madrid, Spain. Her recent research focuses on training and development, gender diversity, and top executive careers. Her articles appeared in Organization Science, in the Strategic Management Journal, in the Journal of Applied Psychology, in the Harvard Business Review and in the Sloan Management Review, among others.