

HIGH-INVOLVEMENT WORK SYSTEMS AND TRAINING OPPORTUNITIES FOR YOUNGER HIGHLY EDUCATED EMPLOYEES

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Abstract

This paper explores the relationship between the training policy of the firm and the nature of the work system adopted at the establishment level. The literature has shown that high-involvement work systems are associated with more inclusive and more effective training. Based on a representative sample of establishments in EU countries, this paper shows that when work systems are more participative training programmes display a higher probability of focusing on future rather than current skill requirements. In addition, the work system adopted significantly moderates the probability of accessing specific types of training by younger educated employees.

Keywords: Training, Training contents, Employability, Younger employees, Highly educated employees, High-involvement work systems.

1 INTRODUCTION

The dynamic nature of human capital and the changing needs of business processes make training a key element of firm strategy. Reliance on the external labour market is seldom enough to secure the skills and competences required to drive current operations and manage incoming change. The study of training practices and the search for systematic association with organisation and trainee characteristics is therefore expected to provide useful indications about how firms and workers may make the best of training investments and how policy makers may remove or lessen the obstacles to training initiatives.

If a consolidated literature agrees on some long-established antecedents to the intensity of training efforts such as firm size, industry, and personnel ratio ([1], [2]), an increase in the uncertainty and complexity of the organisational environment in the last decades has switched the focus to which workplace characteristics may encourage and enhance learning opportunities [3]. High-involvement work systems have attracted particular attention due to the potential of stimulating learning and resilience by promoting employees' active participation ([4], [5]). The key idea behind high-

involvement (or high-performance) work systems is that workplace practices are inherently interconnected, so that the implementation of a set of coherent human resource management tools aimed at skills enhancement, communication, autonomy, and motivation generates complementarities whose effects go well beyond the sum of the outcomes expected from separately adopting each practice ([3], [6]). Not surprisingly given the emphasis placed by those practices on workers' self-activation and learning, past studies have shown that high-involvement work systems are significantly associated with more intense training ([6], [7], [8]) and with a higher effectiveness of training perceived by participating employees ([9], [10], [11]).

Highly educated employees, more frequently involved in knowledge-based tasks, could take greater advantage of the learning opportunities stemming from high-involvement work practices [11]. In a similar way, early exposure to a participative work system may benefit younger employees by establishing a habit to learning and participating that enhances employability skills along all future career steps. However, evidence on the impact of high-involvement systems on the training opportunities provided to highly educated workers, and especially to younger ones, is still inconclusive. In addition, despite the intuition that training quality matters [9], most of the existing studies focus on quantitative measures of the training efforts, such as training hours or share of the workforce involved [9]. Accordingly, evidence is still missing on significant associations between training contents and work system characteristics.

Based on the 2013 wave of the European Company Survey run by Eurofund [12], which reports information on a representative sample of establishments from the (former) 28 EU countries, this paper seeks to advance understanding in the relationship between workplace practices and training practices in three ways. First, the empirical analysis identifies a three-way taxonomy of work systems (labelled as Participative, Exploratory, and Conservative organisations) and three different approaches to training based on the contents of the training activities, respectively focused on health and safety issues and hazard prevention measures, current skill requirements, and future skill requirements. Second, ordinary least square regressions and multinomial logistic regressions are implemented to show that high-performance work systems, a prevalence of younger employees, and a prevalence of employees graduated from tertiary education significantly increase not only the intensity of training efforts, but also the probability that training focuses on future skill needs rather than health and safety issues or current skill requirements. Third, econometric analyses reveal that the work system adopted at the establishment level significantly moderates the probability of accessing specific types of training by younger educated employees.

2 IDENTIFICATION OF WORK SYSTEMS

In 2013 the European Foundation for the Improvement of Living and Working Conditions (Eurofound) launched a new wave of the European Company Survey (ECS), which collects information on a representative sample of establishments/local units in European countries based on interviews with human resource managers. The ECS

provides a suitable dataset to test the existence of differentiated training policies and the moderating role of workplace practices on the training opportunities of younger educated employees. Rich information on training and workplace practices allows characterising each establishment's approach to training and the nature of the prevailing work system. Additional firm- and establishment-level information allows to control for other factors that may significantly impact training investment choices, such as industry and size, financial outcomes, industrial relations, innovation strategy, or workforce characteristics ([1], [2]). To limit variability in the institutional background of the examined establishments the empirical analysis focuses on the (former) 28 EU countries, for which the ECS reports 24,471 unweighted observations.

Measuring the adoption and the intensity of use of high-involvement work systems has proved a challenging task for researchers (e.g., [6], [7], [8], [13],[14]). This difficulty stems from the inherent multi-dimensional nature of the examined construct: a high-involvement work system consists of a set of work practices whose composition can vary in time and across organisations. Empirical analyses therefore try to capture the nature of the work system adopted by means of synthetic indexes that summarise the use of high-involvement work practices, which typically concern teamworking, communication, employees' decisional power, and assessment and reward of (variable) performance. Tab. 1 reports which variables in the ECS dataset describe the adoption and use of the above sets of practices. In line with past studies ([9], [11], [15]), factor analysis based on principal component analysis was used for data reduction when more than one operative variable describes the same set of work practices. Under standard assumptions, factor analyses on variables in Tab. 1 identified one single factor for each set of work practices but in the case of communication practices for which two underlying factors emerged, the former concerning day-to-day communications (Operative communication, involving regular meetings between employees and immediate manager and between managers and all establishment employees), the latter regarding ideas circulation to foster change in routine tasks (Ideas circulation). The factors resulting from the principal component analyses and the categorical variable that reports the share of employees who undergo performance appraisal or evaluation interview at least once a year entered a cluster analysis to identify distinct work systems at the establishment level. Given the simultaneous presence of sequential categorical and continuous variables, a two-step clustering procedure was adopted [18].

If early studies typically opposed a cost-cutting "low road" to human resource management based on low skills and low pay and a "high road" focused on high-involvement work practices ([6], [7], [13]), more recent studies have identified a range of work systems based on diversified combinations of work practices ([9], [16], [17]). The two-step clustering procedure on the ECS dataset, which identified three work systems as the solution characterized by the most statistically distinct clusters (Tab. 2), supports the hypothesis of multiple paths to the implementation of high-involvement work practices. Since all the identified clusters make significant use of at least some high-performance work practices, the three groups resulting from the clustering algorithm can be regarded as diversified approaches to employee involvement based on various combinations and different intensity of practices.

Tab. 2 characterises the profile of workplace practices adopted by the identified clusters. The first cluster, labelled as Participative establishments, includes local units that make the most intense use of high-involvement practices. Participative establishments display the highest mean values in all the variables that enter the cluster analysis with the sole exception of teamworking, whose intensity is nevertheless still well above the average (Teamworking is a standardised variable). At the opposite extreme, local units in the Conservative establishments cluster display a more selective adoption of high-involvement practices. Possibly due to more routinised labour flows, teamworking, and especially autonomous teamworking, is not frequent, formal procedures substitute for direct operative communications, and variable pay is neglected due to highly predictable performances. In contrast, the adoption patterns displayed by establishments in the second cluster present apparent inconsistencies, such as the high use of autonomous teams and the poor circulation of information, or the intermediate value in the use of variable pay coupled with the lowest diffusion of performance appraisal. Under the hypothesis that this behaviour results from the lack of a clear vision concerning workplace practices and human resource management, local units in this cluster were labelled as Exploratory establishments.

3 DEPENDENT VARIABLES AND KEY INDEPENDENT VARIABLES

The metrics adopted to operationalise training crucially affect the assessment of how work systems impact training provision. Measures of training typically concern the intensity of provided training and include hours of training (either on-the-job or off-the-job) or the proportion of workers trained (for a review, see [3]). The focus on training intensity, often motivated by a lack of more detailed information [9], risks nevertheless to overlook variability in training quality and training contents. “The way work is organized has a powerful association not only with the incidence of training but also with its quality. [...] Workplaces that allow employees greater leeway in the way they carry out their work are more able to use the training they receive to change and improve what they do. This suggests that the training received by those in ‘low involvement’ workplaces may be of different quality to the training received by those in ‘high involvement’ workplaces where training is more geared to raising skills levels, improving working practices, offering greater financial rewards and enhancing enjoyment at work.” [9, p.1686].

Thanks to the richness of available information, the ECS dataset allows testing the impact of work systems on both training intensity and training contents. The standardised variable *Tr_participation*, which measures the intensity of participation in on- and off-the-job training at the surveyed establishments, results from a factor analysis on two primitive variables reporting, respectively, the percentage of employees who received on-the-job and off-the-job training in the 12 months before the survey. In contrast, the sequential categorical variable *Tr_contents* takes value 1 for the establishments that in the 12 months before the survey provided mandatory training concerning, for instance, health and safety issues or hazard prevention measures. The same variable takes value 2 for the establishments that, besides mandatory training, provided also training focused on current skill requirements, including improving and extending the skills used in current jobs and providing the skills needed to enable job

rotation among colleagues. Eventually, variable *Tr_contents* takes value 3 for the establishments that, besides mandatory training or training focused on current skill requirements, provided also training focused on future skill requirements, e.g., to enable employees taking on a different position. Whereas variable *Tr_participation* is defined for all EU28 establishments with complete information in the ECS dataset (24,034 unweighted records), variable *Tr_contents* is defined for the subset of establishments that provided some form of training in the 12 months before the survey (21,001 unweighted records).

Besides reporting the main statistics for the two dependent variables *Tr_participation* and *Tr_contents* Tab. 3 offers information about the key independent variables used in the empirical analysis. The latter include the clusters of work systems described in the section above and two binary variables that identify the establishments with a high proportion of younger employees (variable *Young_high*) and a high proportion of employees with a tertiary education certificate (variable *Uni_Edu_high*).

Table 1. Variables that characterise the nature of the establishment-level work system.

Work practice	Variables description and measure	Mean	Std. dev.
Teamworking	Resort to teamworking and number of teams participated by employees (0-2)	1.05	0.76
	Teams autonomy (0-2)	0.93	0.68
Communication	Regular meetings between employees and immediate manager (1-2)	1.86	0.35
	Regular staff meetings open to all employees at the establishment (1-2)	1.60	0.49
	Meetings of a temporary group or committee (1-2)	1.41	0.49
	Dissemination of information through newsletters, website, notice boards, email etc. (1-2)	1.66	0.48
	Suggestion schemes (1-2)	1.41	0.49
	Surveys among employees (1-2)	1.38	0.46
	Individual autonomy	Decision on the planning and execution of the daily work tasks by employees (1-3)	1.52
Share of employees who can adapt the time when they begin or finish their daily work (1-7)		3.56	2.48
Variable pay	Payment by results (1-2)	1.34	0.47
	Pay for individual performance (1-2)	1.43	0.50
	Pay for collective performance (1-2)	1.25	0.43
	Pay for company performance (1-2)	1.30	0.46
Performance appraisal	Share of employees who undergo performance appraisal or evaluation interview at least once a year (1-7)	4.38	2.66

Table 2. Work systems clusters.

Independent variables	Participative establishments (N=9,280)		Exploratory establishments (N=7,358)		Conservative establishments (N=6,065)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Teamworking	0.579	0.528	0.523	0.489	-1.476	0.000
Operative communication	0.490	0.875	-0.320	0.916	-0.390	0.938
Ideas circulation	0.060	0.851	-0.090	1.106	0.020	1.061
Individual autonomy	0.215	1.005	-0.197	0.928	-0.085	1.015
Variable pay	0.316	1.047	-0.161	0.941	-0.284	0.852
Performance appraisal	6.710	0.757	1.950	1.418	3.700	2.712

Table 3. Dependent variables and key independent variables.

Dependent variables			
		Mean	Std. Dev.
Tr_participation ^a	Intensity of participation in on- and off-the-job training	0.00	1.00
			%
Tr_contents ^b	1 = Mandatory training only		7.1
	2 = Training includes also current skill requirements		42.0
	3 = Training includes also future skill requirements		50.9
Key independent variables			
			%
Cluster	1 = Participative establishments		40.9
	2 = Exploratory establishments		32.4
	3 = Conservative establishments		26.7
Young_high	Employees above 50 years of age <20%		55.8
Uni_Edu_high	Employees with tertiary education >60%		13.3

^a Calculated for training and non-training establishments ^b Calculated for training establishments only

4 THE DRIVERS OF TRAINING PARTICIPATION AND TRAINING CONTENTS

Econometric analyses allowed to assess how work systems, employees' age, and employees' education affect quantitative and qualitative provision of training at the establishments surveyed by the ECS inquiry. The first part of this section focuses on the determinants of participation in training, whereas the second one explores the drivers of training programmes contents.

4.1 The determinants of training participation

Training intensity is measured by a standardised variable (Tr_participation) which increases with the share of employees who underwent either on-the-job or off-the-job training in the 12 months preceding the ECS survey. The estimate of the determinants of training participation is therefore based on ordinary least square (OLS) regressions which, besides the key independent variables in Tab. 3, incorporate a rich set of additional controls, including establishment-level and firm-level characteristics. Establishment-level controls account for size class, position within the company, workforce composition, industrial relations, position in the local labour market, innovativeness, contents of provided training, and country. Firm-level controls include financial situation, public or private property, and industry.

Tab. 4 reports the estimate of a base model of the determinants of training intensity that shows the coefficients of all controls, with the sole exceptions of fixed industry and country effects. All key independent variables result highly significant determinants of training participation. As expected, membership in the Participative cluster increases the proportion of employees who participate in training programmes compared to the baseline of Conservative establishments. In contrast, Exploratory establishments train a lower proportion of employees, despite the higher declared resort to high-involvement practices. Both a high share of employees below the age of 50 and a high share of highly educated employees positively affect training intensity, yet the impact of higher education is over twice that of a younger workforce.

Tab. 5 reports the outcomes of two additional models that build up on the base model by adding interactive effects among key independent variables. Model 1 in Tab. 5 reports no statistically significant complementarities between employees' age and education. Compared to older colleagues with a similar qualification, younger graduates from tertiary education enjoy a relative advantage in accessing training opportunities that is nevertheless equal to the advantage enjoyed by younger less educated employees. However, Model 2 in Tab. 5 displays a significant moderating impact of work systems. When employees are predominantly young and well educated, membership in the Exploratory cluster involves a significantly lower intensity of training activities compared to the other clusters. This outcome suggests that work systems closer to well-defined and coherent organisational models, be they participative or not, pay more attention to developing the skills of their more promising human resources.

4.2 The determinants of training contents

A second set of econometric estimates, whose outcomes are reported in Tab. 6 and Tab. 7, assess the determinants of training contents. The dependent variable Tr_contents (Tab. 3) is a sequential categorical variable that increases with the span of the skills pursued by training activities and is therefore defined for the subsample of establishments that provided some form of training in the 12 months before the ECS. Given the sequential nature of the dependent variable an ordered logistic model seems adequate to estimate the odds of more sophisticated training programmes compared to the odds of training initiatives mandated by legal obligations. However, failure in testing the proportional odds assumption, which presumes that the slope

coefficients in the regression model are the same across all response categories, induced to shape the estimation problem by means of a more general multinomial logistic model.

Table 4. The determinants of training intensity – Base model.

Variable	Coefficient	Std. Error	Sig.
Constant	-0.997	0.054	***
Cluster=Participative ^a	0.171	0.016	***
Cluster= Exploratory ^a	-0.075	0.016	***
Young_high	0.049	0.013	***
Uni_Edu_high	0.110	0.020	***
Establishment size = 50-249 ^b	-0.053	0.019	***
Establishment size >=250 ^b	0.011	0.047	
Single establishment ^c	-0.037	0.018	**
Subsidiary of multi-establishment firm ^c	0.223	0.028	***
Employees on temporary contract <80%	0.057	0.015	***
Employees on part-time contract >40%	0.044	0.021	**
Female employees >80%	0.016	0.015	
Establishment trade unions representatives	-0.018	0.015	
Collective wage agreement	-0.015	0.015	
Difficulties in recruiting skilled employees	0.091	0.013	***
Employees poorly motivated	-0.047	0.017	***
Orientation towards internal labour market	0.025	0.006	***
Product innovation in 3 years before survey	0.007	0.015	
Process innovation in 3 years before survey	0.063	0.015	***
Organisation innovation in 3 years before survey	0.060	0.014	***
Mandatory training ^d	0.568	0.015	***
Training in current skill requirements ^d	0.576	0.018	***
Training in future skill requirements ^d	0.093	0.014	***
Bad or very bad financial situation	-0.045	0.023	**
Plans to reduce staff	-0.043	0.017	**
Public sector firm	0.159	0.066	**

OLS regression. Dependent variable: *Tr_participation*. Includes fixed industry effects (6 binary variables) and fixed country effects (28 binary variables). Adjusted R-Square=0.322. *** $p < 0.01$ ** $p < 0.05$.

^a Baseline: Conservative establishments. ^b Baseline: establishment size=10-49. ^c Baseline: Firm headquarters.

^d Baseline: No training.

Table 5. The determinants of training intensity – Interacted models.

Variable	Model 1			Model 2		
	Coeff.	Std. Error	Sig.	Coeff.	Std. Error	Sig.
Constant	-0.998	0.054	***	-1.002	0.054	***
Cluster=Participative ^a	0.171	0.016	***	0.170	0.017	***
Cluster= Exploratory ^a	-0.075	0.016	***	-0.064	0.018	***
Young_high	0.050	0.013	***	0.051	0.013	***
Uni_Edu_high	0.117	0.031	***	0.118	0.031	***
Young_high*Uni_Edu_high	-0.011	0.038				
Young_high*Uni_Edu_high*Participative				0.023	0.041	
Young_high*Uni_Edu_high*Exploratory				-0.175	0.057	***
Young_high*Uni_Edu_high*Conservative				0.067	0.065	
<i>Establishment- and firm-level controls</i>	Yes			Yes		

OLS regressions. Dependent variable: *Tr_participation*. Include control variables as in Table 4. *** $p < 0.01$.

^a Baseline: Conservative establishments.

As in the case of the determinants of training intensity the econometric regressions control for establishment-level and firm-level factors (training contents excluded). However, for the sake of synthesis the outcomes in Tab. 6 and Tab. 7 report the coefficients of key determinant variables only.

The outcomes of the base model (Tab. 6) show that the nature of the prevailing work system matters in driving the contents of provided training. Compared to the baseline of Conservative establishments membership in Participative establishments and, to a lesser extent, in Exploratory establishments significantly increases the probability of investing also in enlarging and deepening employees' skills and not only in mandatory training concerning health and safety issues. The impact is even larger when considering the probability of training the workforce in developing skills that will be needed in the future, for instance to move to a different position.

A prevalence of younger employees increases the probability of more complex training contents only when they address the answer to future skill needs, whereas a prevalence of highly educated workforce is always a significant driver of variable *Tr_contents* and the coefficient size increases when the focus of training switches from current to future skill requirements. A comparison between the outcomes in Tab. 4 and Tab. 6 shows that establishments in the Participative cluster train a larger share of their workforce and training contents expand to a wider range of contents. In contrast, participation in training in Exploratory establishments is lower than Conservative establishments, but provided training has a wider span. In addition, the educational qualification of workforce has a stronger impact on training participation and training contents compared to employees' age and displays also higher statistical significance, in the case of training contents.

Table 6. The determinants of training contents – Base model.

Variable	Training focused on current skill requirements vs. Mandatory training			Training focused on future skill requirements vs. Mandatory training		
	Coeff.	Std. Error	Sig.	Coeff.	Std. Error	Sig.
Intercept	2.559	0.622	***	3.558	0.618	***
Cluster= Participative ^a	0.747	0.094	***	1.276	0.094	***
Cluster= Exploratory ^a	0.377	0.079	***	0.514	0.08	***
Young_high	0.108	0.071		0.183	0.071	**
Uni_Edu_high	0.227	0.129	*	0.302	0.130	**
<i>Establishment- and firm-level controls</i>	Yes			Yes		

Multinomial logistic regression. Dependent variable: *Tr_contents*. Nagelkerke pseudo R-Square=0.137.
 *** $p < 0.01$ ** $p < 0.05$. ^a Baseline: Conservative establishments.

Tab. 7 reports the outcomes of two additional models that test the impact of interactive effects between the nature of the work system, employees' prevailing age, and employees' prevailing qualification. The coefficients estimated for Model 1 in Tab. 7 allow to qualify the positive impact of an educated workforce (variable *Uni_Edu_high*) reported in Tab. 6. The overall effect is driven by the training efforts targeted to younger educated employees (interacted variables *Young_high*=1 and *Uni_Edu_high*=1), whereas the training patterns of establishments characterised by older and highly qualified employees (*Young_high*=0 and *Uni_Edu_high*=1) do not significantly differ from those of the baseline establishments with a prevalence of older and less qualified employees. An interest towards developing the potential of younger employees, irrespective of their qualification level, is witnessed by the coefficients of interacted variable *Young_high*=1 and *Uni_Edu_high*=0, positive and significant when training contents focus on future skill requirements.

Model 2 in Tab. 7 outlines the important moderating effects of work systems on the impact of workforce age and education on training contents. The reference baseline of interactive effects in Model 2 is provided by the combination of *Cluster*=Conservative, variable *Young_high*=0, and variable *Uni_Edu_high*=0. For all workforce profiles the establishments in the Participative cluster display a higher propensity to provide training focused on future skill needs. Establishments characterised by younger and better educated employees have a higher chance of providing training aimed at skills development compared to training on health and safety issues. When training contents concern future skill needs the estimated coefficient is comparably high also in the case of establishments with a prevalence of younger but less educated employees. The members of the Participative cluster reveal less interest towards sophisticated training when the workforce profile is characterised by educated and older employees (the coefficient of interacted variables *Young_high*=0 and *Uni_Edu_high*=1 is positive but non-significant when training concerns current skill needs, and significant but lower than the values assumed by other combinations when training concerns future skill needs). Establishments in the Exploratory cluster

display a similar pattern, yet coefficients are smaller and signal larger gaps between organisations with highly educated and less educated employees. Eventually, for the members of the Conservative cluster the only significant difference from the baseline concerns establishments with a prevalence of younger and highly educated employees, for whom propensity to training focused on current skill needs is even higher than that of Participative establishments.

Table 7. The determinants of training contents – Interacted models.

Model 1	Training focused on current skill requirements vs. Mandatory training			Training focused on future skill requirements vs. Mandatory training		
Variable	Coeff.	Std. Error	Sig.	Coeff.	Std. Error	Sig.
Intercept	2.593	0.622	***	3.599	0.618	***
Cluster=Participative ^a	0.742	0.094	***	1.270	0.094	***
Cluster=Exploratory ^a	0.375	0.790	***	0.512	0.080	***
[Young_high=1]*[Uni_Edu_high=1] ^b	0.587	0.181	***	0.744	0.182	***
[Young_high=1]*[Uni_Edu_high=0] ^b	0.053	0.074		0.124	0.074	*
[Young_high=0]*[Uni_Edu_high=1] ^b	-0.131	0.176		-0.081	0.179	
<i>Establishment- and firm-level controls</i>	Yes			Yes		
Model 2	Training focused on current skill requirements vs. Mandatory training			Training focused on future skill requirements vs. Mandatory training		
Variable	Coeff.	Std. Error	Sig.	Coeff.	Std. Error	Sig.
Intercept	2.705	0.625	***	3.621	0.621	***
[Cluster=Participative]*[Young_high=1]*[Uni_Edu_high=1] ^c	1.024	0.246	***	1.715	0.246	***
[Cluster=Participative]*[Young_high=1]*[Uni_Edu_high=0] ^c	0.797	0.136	***	1.438	0.137	***
[Cluster=Participative]*[Young_high=0]*[Uni_Edu_high=1] ^c	0.122	0.264		0.905	0.263	***
[Cluster=Participative]*[Young_high=0]*[Uni_Edu_high=0] ^c	0.776	0.147	***	1.371	0.148	***
[Cluster=Exploratory]*[Young_high=1]*[Uni_Edu_high=1] ^c	0.733	0.299	**	1.215	0.301	***
[Cluster=Exploratory]*[Young_high=1]*[Uni_Edu_high=0] ^c	0.442	0.118	***	0.692	0.120	***
[Cluster=Exploratory]*[Young_high=0]*[Uni_Edu_high=1] ^c	0.636	0.326	*	0.414	0.342	
[Cluster=Exploratory]*[Young_high=0]*[Uni_Edu_high=0] ^c	0.249	0.114	**	0.465	0.117	***
[Cluster=Conservative]*[Young_high=1]*[Uni_Edu_high=1] ^c	1.370	0.460	***	1.668	0.466	***
[Cluster=Conservative]*[Young_high=1]*[Uni_Edu_high=0] ^c	-0.085	0.113		0.076	0.116	
[Cluster=Conservative]*[Young_high=0]*[Uni_Edu_high=1] ^c	-0.018	0.308		0.147	0.315	
<i>Establishment- and firm-level controls</i>	Yes			Yes		

Multinomial logistic regression. Dependent variable: *Tr_contents*. Nagelkerke pseudo R-Square=0.137.
 *** $p < 0.01$ ** $p < 0.05$. ^a Baseline: Participative establishments. ^b Baseline: [Young_high=0]*[Uni_Edu_high=0].
^c Baseline: [Cluster=Conservative]*[Young_high=0]*[Uni_Edu_high=0].

5 CONCLUSIONS

High-performance work systems demand high-skilled workers. The increase in complexity that brought high-involvement work practices to the attention of researchers and practitioners has also involved a renewed interest in training, which stems from “a need to go beyond static considerations of adapting formal education and training systems to the changing skills needs of firms to a dynamic focus on developing organisational designs with a capacity for continuous learning and adaptation” ([19], p.155). If the literature has proven a significant relationship between the adoption of high-performance work practices and training intensity, the connection with training contents is not yet clear. Moreover, adopting a set of high-involvement practices does not automatically involve a shift to a work system that encourages autonomy, participation, skill enhancement, skill enlargement, and learning. High-involvement practices such as teamworking and job rotation may also pursue higher efficiency by means of increased work pace and peer pressure [5]. On the other hand, misalignment among adopted practices could result in incoherent work systems ([16], [17]). Accordingly, a more nuanced classification of work systems could bring in a deeper understanding of which workplace conditions foster the best training opportunities. This is particularly important in the case of younger graduates from tertiary education, who often miss the essential technical and non-technical workplace skills needed for entry-level jobs [20].

Based on establishment-level data from 28 EU countries collected by the 2013 wave of the ECS, the empirical analysis in this paper provided new evidence on the relationship between work systems and training thanks to a three-way taxonomy of work systems that differentiates between Participative, Exploratory, and Conservative organisations. In line with past studies Participative establishments, which display the closest alignment with high-involvement work systems, provide training to a larger share of their employees. They are followed by Conservative establishments, which make a selective use of high-involvement practices to increase operation efficiency. Exploratory establishments, whose adoption of high-involvement work practices reflects partially incoherent patterns, display the lower intensity of training, especially when the profile of the workforce is characterised by a prevalence of younger highly educated employees. Work systems also significantly impact the nature of provided training. Participative establishments display an inclusive approach to skills-centred training that is particularly strong when employees are mainly younger and gets even stronger in the case of younger highly educated employees. In contrast, Conservative establishments exhibit a more selective approach by favouring training focused on current and future skill requirements only when employees are mainly younger and highly educated. Explorative establishments show an intermediate position characterised by an inclusive approach which nevertheless displays a less intense propensity to more sophisticated training contents.

The proposed analysis has significant implications. Promoting the adoption of high-performance work practices is not enough to ensure inclusion of a large proportion of employees in high-quality training programmes. Support policies should encourage the diffusion of bundles of high-involvement practices coherent with the strategic focus and the organisational structure of firms. A coherent bundle of work practices

also seems crucial to maximise the quantity and the quality of training initiatives in establishments from the Participative and Conservative clusters, and only to a lesser extent by the more ambiguous Explorative establishments.

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REFERENCES

- [1] W. Arulampalam, A.L. Booth, M.L. Bryan, "Training in Europe," *Journal of the European Economic Association*, vol. no. 2-3, 346-360, 2004.
- [2] A. Bassanini, A.L. Booth, G. Brunello, M. De Paola, E. Leuven, "Workplace Training in Europe," in *Education and Training in Europe* (Editors G. Brunello, P. Garibaldi, E. Wasmer), Ch. 8-13, Oxford: Oxford University Press, 2007.
- [3] D. Kim, "High Performance Work Practices and Firm Training," *KLI/ ILO Tripartite Workshop on Skill Development, High Performance Work Organization and Social Dialogue*, Seoul, Korea, March 6, 2003.
- [4] P. Boxall, "High-performance work systems: What, why, how and for whom?," *Asia Pacific Journal of Human Resources*, vol. 50, no. 2, 169-186, 2012.
- [5] P. Boxall, K. Macky, "High-performance work systems and organizational performance: Bridging theory and practice," *Asia Pacific Journal of Human Resources*, vol. 45, no.3, 261-70, 2007.
- [6] J.P. MacDuffie, T.A. Kochan, "Do U.S. Firms Invest Less in Human Resources? Training in the World Auto Industry," *Industrial Relations*, vol. 34, no. 2, 147-168, 1995.
- [7] P. Osterman, "Skill, Training, and Work Organization in American Establishments," *Industrial Relations*, vol. 34, no. 2, 125-146, 1995.
- [8] L.M.Lynch, S.E. Black, "Beyond the Incidence of Employer-Provided Training," *Industrial and Labor Relations Review*, vol. 52, no. 1, 64-81, 1998.
- [9] A. Felstead, D. Gallie, F. Green, Y. Zhou, "Employee involvement, the quality of training and the learning environment: An individual level analysis," *The International Journal of Human Resource Management*, vol. 21, no. 10, 1667-1688, 2010.
- [10] H. Thomas, T. Qiu, "Work-related continuing education and training: Participation and effectiveness," *Journal of Workplace Learning*, vol. 24, no. 3, 157-176, 2012.
- [11] H. Inanc, Y. Zhou, D. Gallie, A. Felstead, F. Green, "Direct Participation and Employee Learning at Work," *Work and Occupations*, vol. 42, no. 4, 447-475, 2015.
- [12] Eurofund, European Foundation for the Improvement of Living and Working Conditions, European Company Survey, 2013 [data collection], UK Data Service, SN: 7735, 2015, <http://doi.org/10.5255/UKDA-SN-7735-1>.
- [13] C. Ichniowski, K.L. Shaw, G. Prennushi, "The effects of human resource management practices on productivity: a Study of steel finishing lines," *American Economic Review*, vol. 87, 291-313, 1997.
- [14] P. Osterman, "How common is workplace transformation and who adopts it?," *Industrial and Labor Relations Review*, vol. 2, 173-88, 1994.
- [15] E. Della Torre, "Collective voice mechanisms, HRM practices and organizational performance in Italian manufacturing firms," *European Management Journal*, vol. 37, 398-410.
- [16] E. Chuang, J. Dill, M. Craft, T.R. Konrad, "A configurational approach to the relationship between high-performance work practices and frontline health care worker outcomes," *Health Services Research*, vol. 47, no. 4, 1460-1481, 2012.

- [17] F. Sgobbi, G.C. Cainarca, "High-Performance Work Practices and Core Employee Wages: Evidence from Italian Manufacturing Plants", *Industrial & Labor Relations Review*, vol. 68, no. 2, 426-456, 2015.
- [18] T. Chiu, D.P. Fang, J. Chen, Y. Wang, C. Jeris, "A Robust and Scalable Clustering Algorithm for Mixed Type Attributes in Large Database Environment," *Proceedings of the seventh ACM SIGKDD international conference on knowledge discovery and data mining*, New York: ACM, 263-268, 2001.
- [19] E. Lorenz, B.A. Lundvall, E. Kraemer-Mbula, P. Rasmussen, "Work Organisation, Forms of Employee Learning and National Systems of Education and Training," *European Journal of Education*, vol. 51, no. 2, 154-175, 2016.
- [20] T. Fettes, K. Evans, E. Kashefpakdel, "Putting skills to work: it's not so much the what, or even the why, but how...", *Journal of Education and Work*, vol. 33, no. 2, 184-196, 2020.