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To cite this article: Roy B. L. Sijbom, Jessie Koen, Roy Peijen & Paul T. Y. Preenen (12 Sep 2024): The impact of workplace changes and supervisor support on employee learning: a nonlinear perspective, Human Resource Development International, DOI: [10.1080/13678868.2024.2401302](https://doi.org/10.1080/13678868.2024.2401302)

To link to this article: <https://doi.org/10.1080/13678868.2024.2401302>



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Published online: 12 Sep 2024.



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The impact of workplace changes and supervisor support on employee learning: a nonlinear perspective

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ABSTRACT

In this study, we examine how workplace changes relate to employee participation in formal learning (i.e. participating in a course or training) and informal learning (i.e. learning from tasks and people at work). Drawing from work design principles, we propose a nonlinear relationship between workplace changes and employee learning, suggesting that multiple changes accelerate employee participation in learning activities. Additionally, we propose that supervisor support for learning moderates this relationship. We examined our hypotheses using survey data from a large subsample of employed workers who participated in the Netherlands Working Conditions Survey (NWCS) in 2018 and 2020. Results showed that workplace changes generally enhance both formal and informal learning. Specifically, we observed a nonlinear relationship for formal learning, however, the pattern of the curve was a decelerating rather than an accelerating one. Further, supervisor support for learning was positively associated with both formal and informal learning and outweighed the association of workplace changes with work-related learning: for employees who experienced high supervisor support, informal learning depended less on workplace changes, but for formal learning it enhanced the found nonlinear relationship and resembled a positive curve that gradually flattens. Results are discussed in light of their theoretical and practical contributions.

ARTICLE HISTORY

Received 18 October 2023
Accepted 29 August 2024

KEYWORDS

Formal and informal learning; work-related learning; change; supervisor support; nonlinear

Introduction

Workplace changes have become increasingly common due to labour market developments such as technological innovation and globalisation (Balliester & Elsheikhi, 2018). These changes encompass technological advancements, modifications in production offerings, and alterations in employee-customer interaction. To properly cope with such ongoing workplace changes, it is essential that employees continually develop new knowledge, skills and abilities (Armstrong & Foley, 2003; Noe et al., 2014). As such, learning in the workplace is a major focus for human resource development (Jeong et al., 2018). Learning can occur through

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formal learning, described as structured educational or training programmes, such as organisation-funded courses and training (Colquitt et al., 2000; Manuti et al., 2015), and through *informal learning*, described as unstructured experiential activities that take place outside the formal educational system (Marsick & Volpe, 1999; Tannenbaum et al., 2010). This study examines how workplace changes relate to participation in both types of learning.

From a theoretical work design perspective, workplace changes affect both how employees work and the conditions under which they operate (Parker et al., 2001). These changes expose employees to new tasks and perspectives, prompting cognitive, motivational, and behavioural processes that facilitate learning (Noe et al., 2014; Parker, 2017). For example, technological advancements may require new skills, while new work relationships can introduce alternative methods and fresh knowledge. Traditionally, studies have focused on single, isolated workplace changes. However, emerging literature suggests that multiple, ongoing changes are more representative (Albert et al., 2000; Kiefer, 2005). Rather than focusing on a single workplace change, we shift the focus towards studying the impact of multiple workplace changes at the same time – which can be described as the occurrence of multiple, complementary, and competing change events that overlap in time and content (Cullen-Lester et al., 2019; Rafferty & Griffin, 2006). We investigate how and when multiple workplace changes are related to participation in formal and informal learning activities. Drawing on work design and learning perspectives (Parker et al., 2021), we propose that multiple workplace changes operate multiplicatively, accelerating participation in learning activities exponentially. That is, the multiplicity of workplace changes increases the need for knowledge acquisition by introducing multiple goals, plans, feedback mechanisms, and the interconnections among these elements. Hence, multiple changes are theorised to accelerate employee learning (Myers, 2018; cf.; Parker, 2017) and this relationship is suggested to be nonlinear (e.g. Wielenga-Meijer et al., 2010).

While workplace changes may compel employees to learn, contextual factors in their immediate work environment can also encourage (proactive) learning. Supervisors are one of those factors of influence when it comes to learning participation, because they are charged, among other things, with bringing learning opportunities to life (Lundqvist et al., 2023; Purcell & Hutchinson, 2007). Indeed, supervisor support is shown to be beneficial for enhancing employees' learning attitudes and behaviour (Kuvaas & Dysvik, 2010; Park et al., 2018) and in the transfer of learning (Blume et al., 2010). Besides directly influencing learning participation (cf. Noe & Wilk, 1993), we therefore also investigate supervisor support for learning as a contextual boundary condition for the nonlinear relationship between workplace changes and employee learning.

Our study contributes to the literature in several ways. First, it explores the nonlinear relationship between workplace changes and employee learning, revealing complexities beyond prior research (Wielenga-Meijer et al., 2010). By specifically examining the multiplicity of workplace changes, we provide a more fine-grained analysis and understanding of the assumed nonlinear pattern between workplace changes and employee learning. Second, by considering supervisor support for learning, our study highlights leaders' crucial role and clarifies the boundary conditions under which workplace changes affect employee participation in learning activities (Noe et al., 2014). Third, our study includes both formal and informal learning, offering a deeper understanding of employee learning in dynamic work environments. Practically, our results identify how and when employee learning occurs in evolving work environments.

Theoretical background and hypotheses

Workplace changes and employee learning

Workplace changes are pervasive in contemporary organisations, affecting employees' tasks, roles, performance, and work conditions (Hetzner et al., 2009; Knight & Parker, 2021). These changes often require new knowledge, skills, responsibilities, and interactions, thereby imposing learning demands on employees. For example, employees may need to acquire new skills to operate emerging technology or they may face new responsibilities in their role and in their tasks. Consequently, workplace changes can be seen as a primary driver for employees to engage in learning activities (Bauer & Gruber, 2007; Marsick & Watkins, 2003).

We adopt a work design perspective (Parker, 2017) to understand how workplace changes affect employee learning. Using Parker's (2017) 'work design growth model' and Wielenga-Meijer et al. (2010) systematic review as theoretical lenses, we argue that workplace changes impact both the way employees work and the conditions under which they do so (Parker et al., 2001). These changes activate cognitive, behavioural, and affective processes that affect employee learning and development (Parker, 2017). For instance, workplace changes may lead to increased task roles which can broaden perspectives and facilitate knowledge acquisition, while new work relationships may provide more feedback, enhancing skill development (Frese & Zapf, 1994). This occurs through cognitive processes (e.g. information about the adequacy of one's mental model) and motivational processes (e.g. the gap between required and expected performance motivating a desire to learn). Moreover, workplace changes may involve executing a broader variety of tasks, establishing new work relationships, or taking on more responsibility. Such changes can create urgency among employees, compelling them to acquire new skills, knowledge and abilities, and to develop more effective work strategies and behaviours (De Witte et al., 2007; Rau, 2006).

Most research on workplace changes tends to view them as having a positive linear relationship with employee learning (for reviews, see Noe et al., 2014; Wielenga-Meijer et al., 2010). Yet, two reviews reported mixed findings between workplace change demands (e.g. increased workload) and learning outcomes, suggesting that this relationship may actually be nonlinear (Taris & Kompier, 2005; Wielenga-Meijer et al., 2010). A study by Van Ruyseveldt and Van Dijke (2011) provided initial evidence for such a nonlinear relationship between work design characteristics, workload and autonomy, and subsequent learning outcomes. Also, Wielenga-Meijer et al. (2011) showed evidence for a nonlinear relationship between autonomy and learning outcomes in an experimental study. Building on this prior work, we propose that the relationship between workplace changes and employee learning may be nonlinear as well.

The nonlinear relationship between workplace changes and employee learning

Change events within contemporary organisations are rarely isolated; instead, they often lead to multiple, interconnected workplace changes. This idea aligns with sociotechnical systems theory (Cherns, 1976), which is a work design theory that focuses on optimising both the social and technical aspects of work. According to this theory, organisations are complex systems comprising many interdependent components. Consequently, a change

in one aspect of work necessitates adjustment in other aspects of work to enhance overall effectiveness (Davies et al., 2017). For example, a technological innovation in bicycle production can change both the product assembly process and job execution, requiring employees to master new technology and adjust the order and speed of their tasks. Similarly, significant change events such as mergers or reorganisations can alter targets, but also social interactions with colleagues and customers. Thus, change events often impact multiple interdependent aspects of work design. This raises the question: what happens when multiple changes occur concurrently?

We propose that multiple workplace changes will accelerate employee learning exponentially. This assumption is rooted in theory and research in human factors and work design. Research shows that combining alterations in various work design characteristics (e.g. autonomy, feedback, job complexity and/or job challenge) can synergistically accelerate knowledge acquisition and learning (for a review, see Parker et al., 2021). Specifically, the demand-control model (Karasek & Theorell, 1990; Taris & Kompier, 2005) suggests that an 'active job' with high demands and high control facilitates knowledge acquisition. Likewise, Frese and Zapf (1994) argue, based on German action theory, that job autonomy, complexity, and feedback collectively promote learning. When combined, these work design characteristics allow workers to engage in a 'complete' action sequence involving goal setting, plan development, decision making, monitoring, and feedback. Over time, workers use and combine these different job aspects using problem-solving and metacognitive strategies, leading to better task understanding and enhanced knowledge acquisition (Parker et al., 2021).

Based on the above, we expect that the nonlinear relationship between workplace changes and employee learning will follow an accelerating pattern. When no workplace changes are taking place, there is no need for employees to learn new skills or abilities, because their current skills are still sufficient to execute tasks. So, there is hardly any stimulation from the work context to learn, and thus, participation in formal and informal learning activities will be relative low. When a single workplace change is taking place, such as a product design modification, employees become more compelled and engaged to acquire the necessary skills and abilities to deal with this change. As such, the changes in the work context do stimulate employees to a certain degree to learn. The necessity to acquire new skills will further increase when multiple workplace changes occur at the same time because of the multiplicative changes that are accompanied by these changes. That is, the amount of changes in various aspects of how the work is done will increase exponentially due to the interconnectivity between these different elements (cf. Davies et al., 2017), which will likely result in an accelerated and multiplicative need to acquire new skills and abilities. This logic is supported by fundamental insights from the creativity literature, in which any piece of new information will lead to a multiplicative series of new combinations (cf. Quinn et al., 1996).

Thus, we propose that the combined impact of multifaceted workplace changes necessitates a more profound learning experience. To cope and deal with these exponential requirements in new knowledge, skills and abilities, employees' participation in formal learning activities is likely to follow the same pattern and accelerate in strength. We also expect that engagement in informal learning will increase

exponentially, thereby enabling employees to learn from their changed work tasks. We thus hypothesise that:

Hypothesis 1: Workplace changes have a nonlinear relationship with employee (a) formal learning and (b) informal learning, such that the positive relationship is stronger at higher levels of workplace changes.

The relationship between supervisor support for learning and employee learning

Work-related learning does not take place in a vacuum: other factors in employees' direct work environment may affect employee learning. In fact, workplace learning is a continuous process in which employees improve themselves by acquiring new knowledge and skills, rather than a one-time endeavour. The organisation's learning culture, the social workplace environment, and supervisors are pivotal examples that shape employees' learning journey (Ford et al., 1992; Noe et al., 2014). Here, we focus on the role of supervisor support for learning as a relevant variable for employee learning, because supervisors are one of the most direct, important and dominant sources of social cues for employees (Chen & Bliese, 2002) and shown to be a pivotal relational work characteristic that provides social resources (Ng & Sorensen, 2008; Parker & Knight, 2024).

Supervisor support for learning concerns stimulating employees to acquire new skills, abilities, and personal development (Kraimer et al., 2011; Maurer et al., 2002). This is achieved by encouraging participation in training and development programmes and information exchange with colleagues. By doing so, supervisors signal to employees that they care for their development (cf. Eisenberger et al., 2002). Evidence from HRD literature shows that by demonstrating and signalling support for learning, supervisors motivate employees' learning and development (Lancaster & DiMilia, 2014; Maurer et al., 2003). In a related literature, supervisor support appears beneficial for transfer of training (Blume et al., 2010; Burke & Hutchins, 2007). For example, supervisors may support transfer of training by assisting in identifying situations to use new skills and in guiding the application of trained skills (Holton et al., 2000). Our conceptualisation of supervisor support focuses on encouraging employees to learn new skills and abilities rather than supporting transfer of training.

Previous work suggests that supervisor support is an important relational work characteristic critical for employee learning (e.g. Kraimer et al., 2011; Paterson et al., 2014) and significantly improves employee workplace learning (Wang & Zhang, 2022). Supervisor support for learning provides employees with the encouragement and assistance to engage in learning (Macneil, 2001), but also conveys expectations that learning is expected and valued by the organisation (Kuvaas & Dysvik, 2010). For example, supervisor developmental feedback motivates workplace learning in general, and it aids employees to (self-)regulate the gaps between their current performance and expected goals, thus forming a clear direction for self-improvement and development (George & Zhou, 2007). Accordingly, we hypothesise:

Hypothesis 2: Supervisor support for learning is positively related to employee (a) formal learning and (b) informal learning.

The moderating role of supervisor support for learning

Besides a direct relationship with employee learning, supervisor support for learning might also be an important contextual condition affecting the nonlinear relationship between workplace changes and employee learning. Although learning is embedded in a work context, learning might depend less on workplace changes when employees experience high levels of supervisor support because they are encouraged to proactively engage in learning. However, under conditions of low supervisor support, employees are not stimulated to learn and, consequently, workplace changes may be an essential triggering factor for learning.

The main premise of our moderating mechanism is that supportive supervisors foster employee motivation to learn and facilitate access to necessary resources, stimulating proactive and self-initiated learning regardless of external triggers such as changes at work. Specifically, supervisors who advocate learning and provide a clear understanding of available learning structures and possibilities (Kraimer et al., 2011), are more likely to engage employees in learning activities proactively (Noe et al., 2010). Such supervisors prioritise employee development by communicating the importance of learning and demonstrating its value, inspiring employees to take initiative in their own development (Crouse et al., 2011; Macneil, 2001). Moreover, supportive supervisors act as sponsors of learning initiatives within organisations, offering both verbal and practical support, such as making resources available for training and promoting information sharing on the job (Kim et al., 2019). By facilitating skill acquisition, knowledge enhancement, and providing diverse learning opportunities, supportive supervisors empower employees to pursue their goals (Wang & Zhang, 2022). Consequently, employees under supportive supervisors likely feel empowered and motivated to take action to learn and develop themselves, irrespective of changes in the work environment. While some exposure to change may prompt these employees to further engage in learning, a saturation point may be reached where additional changes add little to their motivation in developing new skills and knowledge. Their engagement in learning is already high, and learning also requires time and resources. In such cases, the positive relationship between changes at work and employee learning may weaken, as employees are already actively engaged in developing new skills.

In contrast, when supervisors provide low support for learning, they fail to inspire and encourage their employees to enhance their skills. These supervisors overlook opportunities to prompt employees to recognise their need for new knowledge. So, learning is neither encouraged nor conveyed as valuable (Macneil, 2001; Wang & Zhang, 2022). Consequently, employees lack motivation and encouragement to adapt and acquire new skills, even when workplace changes arise. However, with each additional change, employees may begin to feel the pressure to engage in learning as a reaction to these changes, i.e. primarily driven by necessity rather than the encouragement from their supervisors. Thus, under conditions of low supervisor support for learning, employees may only engage in learning when the demands of workplace changes become unavoidable. We anticipate that the positive relationship between workplace changes and learning will initially be weak but will strengthen with the occurrence of multiple changes. In sum, we hypothesise the following:

Hypothesis 3: Supervisor support for learning moderates the nonlinear relationship between workplace changes and employee (a) formal learning and (b) informal learning. Specifically, the positive relationship between workplace changes and learning is stronger at higher levels of workplace changes, but only when supervisor support is low. Conversely, when supervisor support is high, the positive relationship between workplace changes and learning is weaker at higher levels of workplace changes.

Methods

Research design and procedure

To test our hypotheses, we analysed self-reported survey data from two annual samples (2018 and 2020) of employed workers in the Netherlands. The respondents participated in the Netherlands Working Conditions Survey (NWCS) for Employees, conducted by the Netherlands Organization for Applied Scientific Research (TNO) (Hooftman et al., 2019, 2021). The NWCS annually surveys a representative sample of the Dutch labour force, addressing topics such as mental and physical health, working conditions, and sustainable employability. The survey employs a sampling strategy that minimises participant overlap across years. The NWCS is conducted in compliance with the Dutch Personal Data Protection Act and is approved by an internal review board at TNO. Due to questionnaire constraints, the NWCS uses abbreviated scales and simplified response options. Detailed information on the survey methodology and validity can be found in Hooftman et al. (2019, 2021). The collaboration with Statistics Netherlands ensures robust data collection. Participants were informed about their privacy rights and the confidentiality of their responses, and their consent was obtained for the use of their answers for research purposes.

Participants were initially contacted with an introductory letter inviting them to take part in the survey online, which included their login details and an information brochure. As an incentive, participants had the chance to win a €400 gift card or an iPad for participating. The current study used data from 2018 and 2020 to test hypotheses related to formal learning. To test the hypotheses related to informal learning, a subsample of the 2020 data was used because the NWCS implemented a ‘split-half’ design methodology in 2020, in which different constructs are assessed for each subsample. This approach involved randomly dividing the 2020 sample into two equal halves; questions pertaining to informal learning were assessed in only one of these groups. For clarity, this subsample will be referred to as 2020b.

Sample

Table 1 shows the descriptives of the used NWCS samples (2018, 2020 for formal learning, and 2020b for informal learning). We also ran a model with the combined 2018/2020 sample, and its descriptives are included for clarity. All samples exhibit relatively similar distributions in terms of supervisor support for learning, gender, education level, job insecurity, job tenure, and organisational tenure. However, there is variation in reported participation in formal learning between 2018 and 2020 (see Table 1; $\Delta_{2020-2018} = -5\%$).

Table 1. Descriptive statistics for the 2018, 2020, 2020b and 2018/2020 samples.

	Formal learning 2018 (N = 60,648)						Formal learning 2020 (N = 56,350)						Informal learning 2020b (N = 28,168)						Formal learning 2018/2020 (N = 116,998)						
	M	SD	Min	Max	N	Missing	M	SD	Min	Max	N	Missing	M	SD	Min	Max	N	Missing	M	SD	Min	Max	N	Missing	
Formal learning	0.54	0.50	0	1	60,648	0	0.52	0.50	0	1	56,350	0								0.53	0.50	0	1	116,998	0
Yes	0.53	0.00	0	1	32,452	0	0.48	0.00	0	1	29,128	0								0.47	0.00	0	1	55,418	0
No	0.47	0.00	0	1	28,196	0	0.52	0.00	0	1	27,222	0								0.53	0.00	0	1	61,580	0
Informal learning																									
Workplace changes	1.10	1.16	0	4	60,648	0	1.27	1.22	0	4	56,350	0	1.28	1.23	0	4	28,168	0	2.28	0.60	1	3	28,168	0	
Workplace changes - squared	2.56	3.99	0	16	60,648	0	3.12	4.39	0	16	56,350	0	3.14	4.41	0	16	28,168	0	3.14	0.70	0	16	116,998	0	
Supervisor support for learning	2.02	0.70	1	3	60,648	369	2.06	0.69	1	3	347	0.06	2.07	0.69	1	3	28,168	213	2.04	0.20	0.70	1	3	116,998	716
Not at all	0.23	0.00	0	1	14,037	n/a	0.21	0.00	0	1	11,847	n/a	0.21	0.00	0	1	5,831	n/a	0.22	0.00	0	1	25,884	n/a	
To a certain extent	0.51	0.00	0	1	30,785	n/a	0.51	0.00	0	1	28,885	n/a	0.51	0.00	0	1	14,434	n/a	0.51	0.00	0	1	59,670	n/a	
To a great extent	0.26	0.00	0	1	15,457	n/a	0.27	0.00	0	1	15,271	n/a	0.27	0.00	0	1	7,690	n/a	0.26	0.00	0	1	30,728	n/a	
Job insecurity	0.15	0.36	0	1	60,648	0	0.16	0.37	0	1	56,350	0	0.16	0.37	0	1	28,168	0	0.16	0.36	0	1	116,998	0	
Education level	2.24	0.73	1	3	60,648	0	2.31	0.73	1	3	56,350	0	2.30	0.73	1	3	28,168	28,168	2.27	0.73	1	3	116,998	0	
Low educated	0.18	0.00	0	1	10,677	n/a	0.16	0.00	0	1	8,822	n/a	0.16	0.00	0	1	4,465	n/a	0.17	0.00	0	1	19,499	n/a	
Intermediate educated	0.41	0.00	0	1	24,596	n/a	0.38	0.00	0	1	21,298	n/a	0.38	0.00	0	1	10,676	n/a	0.39	0.00	0	1	45,894	n/a	
High education	0.42	0.00	0	1	25,375	n/a	0.47	0.00	0	1	26,230	n/a	0.46	0.00	0	1	13,027	n/a	0.44	0.00	0	1	51,605	n/a	
Age	42.6	14.4	15	75	60,648	0	42.8	14.5	15	75	56,350	0	42.8	14.5	15	75	28,168	0	42.7	14.4	15	75	116,998	0	
Gender	0.50	0.00	0	1	60,648	0	0.50	0.00	0	1	56,350	0	0.50	0.00	0	1	14,354	0	0.50	0.00	0	1	116,998	0	
Female	0.50	0.00	0	1	30,152	n/a	0.51	0.00	0	1	28,677	n/a	0.51	0.00	0	1	14,354	n/a	0.50	0.00	0	1	58,829	n/a	
Male	0.50	0.00	0	1	30,496	n/a	0.49	0.00	0	1	27,673	n/a	0.49	0.00	0	1	13,814	n/a	0.50	0.00	0	1	58,169	n/a	
Organizational tenure	10.80	10.80	0.08	55.30	58,948	1,700	10.60	10.80	0.08	58.40	53,750	2,600	10.70	10.80	0.08	56.3	27,434	734	10.70	10.80	0.08	58.4	113,810	3,188	
Job tenure	8.50	9.36	0.08	54.40	58,070	2,578	8.21	9.26	0.08	58.4	54,110	2,240	8.20	9.20	0.08	52.4	27,040	1,128	8.36	9.31	0.08	58.4	112,180	4,818	

Note. The descriptive summary above differentiates the 2020 sample based on the distinction between formal and informal learning since not all respondents completed the questions related to informal learning.

The 2018 sample consisted of 50.3% men and 49.7% women, with an average age of 42.6 years ($SD = 14.4$). In terms of education, 40.6% had vocational training, 41.8% held a bachelor's or master's degree, and 17.6% had a high school or other degree. Respondents had an average job tenure of 8.5 years ($SD = 9.4$), 10.8 years of organisational tenure ($SD = 10.8$), and worked 29.0 hours per week ($SD = 11.9$). In 2020, the sample consisted of 49.1% men and 50.9% women, with an average age of 42.8 years ($SD = 14.5$). Of these, 37.8% had vocational training, 46.5% held bachelor's or master's degrees, and 15.7% had high school or other degrees. On average, respondents reported 8.21 years of job tenure ($SD = 9.3$), 10.6 years of organisational tenure ($SD = 10.8$), and worked 29.3 hours per week ($SD = 11.6$).

Measures

The measures presented below were similar in both the 2018 and 2020 waves. Please note that informal learning was only measured in 2020b.

Workplace change checklist

The workplace change checklist asked whether respondents experienced any significant structural changes within the last 12 months on the following dichotomous items: (1) changes in the technology, such as machines or information and communication technology (ICT); (2) changes in the way jobs are done or how employees are led; (3) changes in the products/services to be made or provided; (4) changes in the amount of contact with customers (or patients, students, or passengers, etc.); and (0) none of those mentioned above. Every item represents one possible change endeavour, and respondents were asked to indicate whether this change occurred in their work (yes or no). The workplace change index was constructed by calculating the sum of the four dichotomous items and thus ranges from 0 (*none of the changes were experienced*) to 4 (*all four changes were experienced*). This variable is used as an 'index' rather than a theoretical factor (cf. Kiefer, 2005). The nonlinear function can be approximated by creating an additional variable that squares the workplace change values. By incorporating the workplace changes-variable and its squared counterpart in the modelling, we can evaluate the nonlinear relationship.

Supervisor support for learning

Supervisor support for learning was assessed with the following question: 'Does your supervisor encourage the development of your knowledge and skills?', as outlined by Koppes et al. (2013). Respondents could select from three response options: (1) not at all; (2) to a certain extent; or (3) to a great extent.

Employee learning

Formal learning was assessed using a dichotomous variable where respondents indicated ('no' or 'yes') whether they had undertaken any work-related training or courses in the past two years (Koppes et al., 2013). *Informal learning* was assessed with two items asking respondents to indicate how much they had learned from (1) tasks they perform for their jobs; and (2) people at work, such as colleagues, supervisors and customers. Respondents rated their learning on a scale from (1) 'not so much' to (3) 'very much'. A scale was constructed by taking the average of those two items ($\alpha = 0.73$).

Control variables

Meta-analytical evidence indicates correlations between demographic variables – such as gender, educational level, and age – and formal and informal learning behaviours (cf. Cerasoli et al., 2018; Kleine et al., 2019). Also, research showed that perceived job insecurity reduces participation in learning activities (Van Hooetegem et al., 2023). Therefore, we included these variables as potential control variables in our study. *Gender* was coded as (0) male, (1) female; *educational level* was categorized as (1) low educated (ISCED2011-Levels 0–2), (2) intermediate educated (ISCED2011-Levels 3–4), and (3) high educated (ISCED2011-Levels 5–8); and *age* was treated as a continuous variable (range 15–75). Perceived *job insecurity* was assessed with a single question asking respondents if they were concerned about job retention, coded as (0) no and (1) yes.

Analytical approach

We used logistic regression models to predict the probability of formal learning and we used OLS regression models to predict the values of informal learning. For the analyses, we present both the log-odds/unstandardised coefficients and the standardised coefficients. The log odds in logistic regression and unstandardised coefficients (b) in regression represent the change of the outcome for a one-unit change in the predictor variable. The standardised coefficients (β) are adjusted for the scale of the predictor variables, allowing for direct comparison of the relative importance of each predictor variable in the model, regardless of their original scales or units (Aiken & West, 1991). Therefore, standardised coefficients can be interpreted as follows: effect sizes around 0.10 are said to be small, effect sizes around 0.30 are medium, and effect sizes of 0.50 or greater are large (Cohen, 1992).

To test our hypotheses, we entered the variables in three consecutive steps. In the first step, we entered the linear workplace changes variable, the quadratic workplace changes variable, and the control variables. In the second step, we entered the supervisor support for learning variable. Specifically, we included the two dummy variables representing the extent to which supervisors stimulate employee learning with ‘not at all’ as the reference category to the model. In the third step, we entered the linear interaction terms between supervisor support for learning and workplace changes and the interaction terms between quadratic workplace changes and supervisor support for learning. For clarity, all interaction terms were centred around their mean (Aiken & West, 1991).

For formal learning, separate analyses were conducted for the 2018, 2020, and 2018/2020 sample. We included a dummy variable (Sample: 2018 = 0, 2020 = 1) in the combined sample model to control for annual effects on employee learning estimates. For informal learning, results are reported only for the 2020b subsample because this construct was not assessed in earlier NWCS waves and due to the earlier mentioned split-half design.

Results

Tables 2 and 3 provide the results for the hypotheses related to employee’s formal learning and informal learning, respectively. Hypothesis 1 stated that workplace changes have a nonlinear relationship with employee formal and informal learning in such a way that multiple workplace changes accelerate employee learning.

Table 2. Log-odds and standardized coefficients (β) for the nonlinear relationship of workplace changes and supervisor support on formal learning for 2018, 2020 and 2018/2020 sample, from logistic regression models.

Variables	Formal learning 2018						Formal learning 2020						Formal learning 2018/2020					
	(1)		(2)		(3)		(1)		(2)		(3)		(1)		(2)		(3)	
	Log-odds	β	Log-odds	β	Log-odds	β	Log-odds	β	Log-odds	β	Log-odds	β	Log-odds	β	Log-odds	β	Log-odds	β
Intercept	-1.06 (0.03)	-0.51***	-2.02 (0.04)	-1.38***	-1.99 (0.04)	-1.41***	-1.07 (0.04)	-0.54***	-2.00 (0.04)	-1.38***	-2.02 (0.05)	-1.40***	-1.15 (0.03)	-0.53***	-2.11 (0.03)	-1.39***	-2.11 (0.03)	-1.41***
Workplace changes	0.45 (0.02)	0.36***	0.44 (0.02)	0.35***	0.36 (0.05)	0.31***	0.36 (0.02)	0.33***	0.35 (0.02)	0.32***	0.34 (0.05)	0.35***	0.40 (0.01)	0.35***	0.39 (0.02)	0.33***	0.35 (0.03)	0.33***
Workplace changes -squared	-0.06 (0.01)	-0.08***	-0.06 (0.01)	-0.08***	-0.04 (0.01)	-0.06**	-0.03 (0.01)	-0.05***	-0.03 (0.01)	-0.05***	-0.02 (0.01)	-0.03	-0.05 (0.00)	-0.07***	-0.05 (0.00)	-0.07***	-0.03 (0.01)	-0.04**
<i>Supervisor support for learning</i>																		
Not at all (ref.)																		
To a certain extent			1.03 (0.02)	1.03***		0.99			0.94 (0.02)	0.94***	1.01 (0.04)	0.95***			0.99 (0.02)	0.99***	1.00 (0.03)	1.00***
To a great extent			1.62 (0.03)	1.62***	1.57 (0.04)	1.68***			1.57 (0.03)	1.57***	1.54 (0.04)	1.62***			1.60 (0.02)	1.60***	1.55 (0.03)	1.65***
<i>Supervisor support for learning changes</i>																		
Not at all (ref.) x Workplace changes																		
Not at all (ref.) x Workplace changes-squared																		
To a certain extent x Workplace changes					0.07 (0.05)	0.04					-0.03 (0.06)	-0.07					0.02 (0.04)	-0.01
To a certain extent x Workplace changes-squared					-0.02 (0.02)	-0.02					-0.01 (0.02)	-0.01					-0.01 (0.01)	-0.02
To a great extent x Workplace changes					0.16 (0.06)	0.07*					0.10 (0.07)	0.03					0.13 (0.05)	0.05**
To a great extent x Workplace changes-squared					-0.04 (0.02)	-0.06*					-0.03 (0.02)	-0.05					-0.04 (0.01)	-0.05**

(Continued)

Table 2. (Continued).

Variables	Formal learning 2018			Formal learning 2020			Formal learning 2018/2020		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Log- odds β	Log- odds β	Log- odds β	Log- odds β	Log- odds β	Log- odds β	Log- odds β	Log- odds β	Log- odds β
Job insecurity	-0.24 (0.02)	-0.09*** (0.02)	-0.02* (0.02)	-0.37 (0.02)	-0.14*** (0.02)	-0.21 (0.02)	-0.31 (0.02)	-0.11*** (0.02)	-0.13 (0.02)
Education level									
Low educated (ref.)	—	—	—	—	—	—	—	—	—
Intermediate educated	0.64 (0.02)	0.61 (0.03)	0.61*** (0.03)	0.56 (0.03)	0.56*** (0.03)	0.52 (0.03)	0.61 (0.02)	0.61*** (0.02)	0.57 (0.02)
High educated	1.14 (0.03)	1.01 (0.03)	1.01*** (0.03)	0.97 (0.03)	0.97*** (0.03)	0.84 (0.03)	1.06 (0.02)	1.06*** (0.02)	0.93 (0.02)
Sex									
Male (ref.)	—	—	—	—	—	—	—	—	—
Female	0.04 (0.02)	0.01 (0.02)	0.01 (0.02)	0.09 (0.02)	0.04*** (0.02)	0.06 (0.02)	0.06 (0.01)	0.03*** (0.01)	0.04 (0.01)
Age	0.00 (0.00)	0.05*** (0.00)	0.01 (0.00)	0.00 (0.00)	0.04*** (0.00)	0.01 (0.00)	0.00 (0.00)	0.05*** (0.00)	0.01 (0.00)
Year									
2020 (ref.)	—	—	—	—	—	—	—	—	—
2018	—	—	—	—	—	—	—	—	—
N	60,648	60,279	60,279	56,350	56,003	56,003	116,998	116,282	116,282
R ²	0.07	0.14	0.14	0.07	0.12	0.12	0.07	0.13	0.13

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, standard errors in parentheses.

Table 3. Unstandardized (*b*) and standardized coefficients (β) for the linear relationship of workplace changes and supervisor support on informal learning for 2020b sample, from OLS regression models.

Variables	Informal learning 2020b							
	(1)		(2)		(3)		(4)	
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
Intercept	2.22 (0.01)	−0.21***	2.23 (0.01)	−0.22***	1.83 (0.01)	−0.83***	1.81 (0.02)	−0.82***
Workplace changes	0.04 (0.00)	0.08***	0.04 (0.01)	0.08***	0.03 (0.00)	0.06***	0.05 (0.01)	0.10***
Workplace changes – squared			0.00 (0.00)	0.00				
<i>Supervisor support for learning</i>								
Not at all (ref.)					–	–	–	–
To a certain extent					0.41 (0.01)	0.69***	0.43 (0.01)	0.69***
To a great extent					0.75 (0.01)	1.25***	0.78 (0.01)	1.25***
<i>Supervisor support for learning</i>								
Not at all (ref.) x Workplace changes							–	–
To a certain extent x Workplace changes							−0.02 (0.01)	−0.03*
To a great extent x Workplace changes							−0.03 (0.01)	−0.06***
Job insecurity	−0.13 (0.01)	−0.08***	−0.13 (0.01)	−0.08***	−0.05 (0.01)	−0.03***	−0.05 (0.01)	−0.03***
<i>Education level</i>								
Low educated (ref.)	–	–	–	–	–	–	–	–
Intermediate educated	0.07 (0.01)	0.12***	0.07 (0.01)	0.12***	0.04 (0.01)	0.06***	0.04 (0.01)	0.06***
High educated	0.22 (0.01)	0.37***	0.22 (0.01)	0.37***	0.13 (0.01)	0.22***	0.13 (0.01)	0.22***
<i>Sex</i>								
Male (ref.)	–	–	–	–	–	–	–	–
Female	0.04 (0.01)	0.04***	0.04 (0.01)	0.04***	0.03 (0.01)	0.03***	0.03 (0.01)	0.03***
Age	−0.00 (0.00)	−0.07***	−0.00 (0.00)	−0.07***	−0.00 (0.00)	−0.05***	−0.00 (0.00)	−0.05***
N	28,168		28,168		27,955		27,955	
R ²	0.05		0.05		0.23		0.23	

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, standard errors in parentheses.

Logistic regression analyses revealed that the quadratic term of workplace changes was significant in relation to formal learning for all three samples (2018: Log-odds = −0.06, $\beta = -0.08$, $p < .001$; 2020: Log-odds = −0.03, $\beta = -0.05$, $p < .001$; 2018/2020: Log-odds = −0.05, $\beta = -0.07$, $p < .001$; see Table 2's Model 1 and Figure 1a–c), but not significant in relation to informal learning (2020b: $b = 0.00$, $\beta = 0.00$, $p = .600$; see Table 3's Model 2 and Figure 1d). Although the results support a nonlinear relationship between workplace changes and formal learning, Figure 1(a) show that the curve of these nonlinear relationships is a decelerating curve rather than the hypothesised accelerating curve. Therefore, Hypothesis 1a and 1b were not supported.

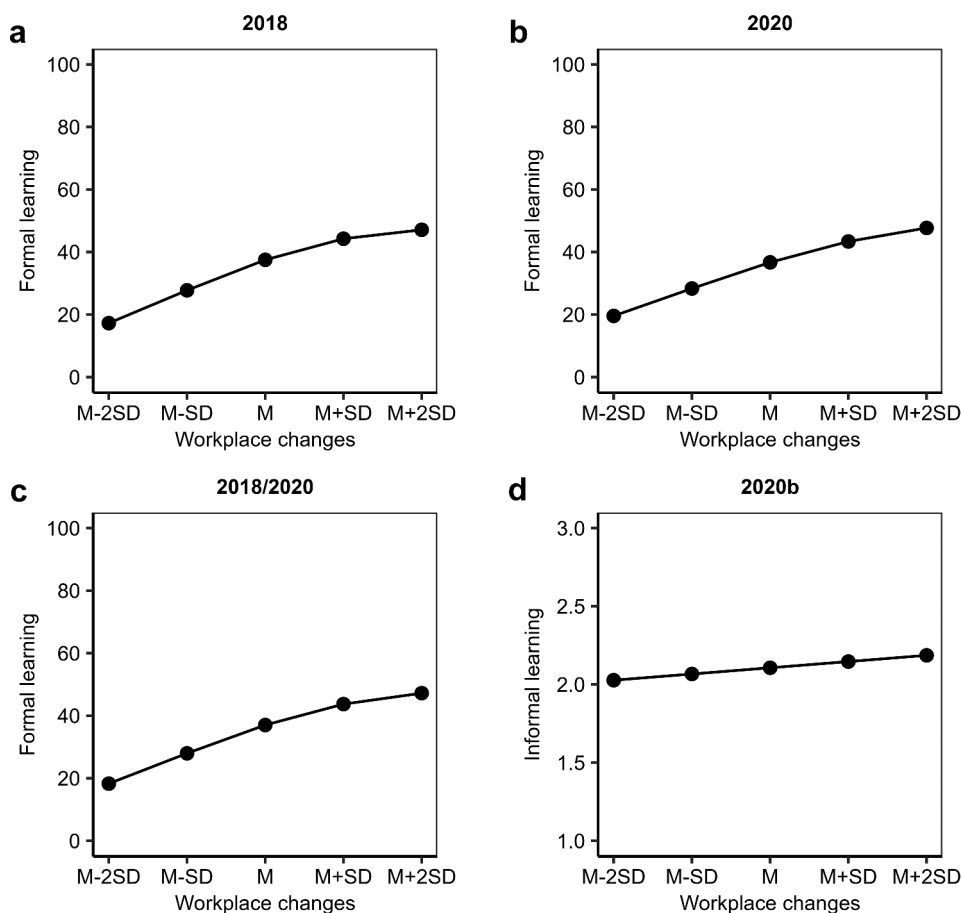


Figure 1. Predicted probabilities of the nonlinear relationship between workplace changes and formal learning (a, b, c) and the linear relationship between workplace changes and informal learning (d).

Hypothesis 2 stated that supervisor support for learning is positively related to employee formal (H2a) and informal learning (H2b). Results showed that high levels of supervisor support for learning ('to a great extent') positively and significantly impacted formal (2018: Log-odds = 1.62, $\beta = 1.62$, $p < .001$; 2020: Log-odds = 1.57, $\beta = 1.57$, $p < .001$; 2018/2020: Log-odds = 1.60, $\beta = 1.60$, $p < .001$, see Table 2's Model 2) and informal learning (2020b: $b = 0.75$, $\beta = 1.25$, $p < .001$, see Table 3's Model 3) compared to low levels ('not at all'). Moderate levels of supervisor support for learning ('to a certain extent') positively impacted formal learning (2018: Log-odds = 1.03, $\beta = 1.03$, $p < .001$; 2020: Log-odds = 0.94, $\beta = 0.94$, $p < .001$; 2018/2020: Log-odds = 0.99, $\beta = 0.99$, $p < .001$, see Table 2's Model 2) and informal learning (2020b: $b = 0.41$, $\beta = 0.69$, $p < .001$, see Table 3's Model 3) compared to low levels, but less prominently, supporting Hypothesis 2a and 2b.

Hypothesis 3 stated that supervisor support for learning moderates the nonlinear relationship between workplace changes and formal (H3a) and informal learning (H3b). Model 3 in Table 2 includes the interaction effects between the squared workplace changes term and the

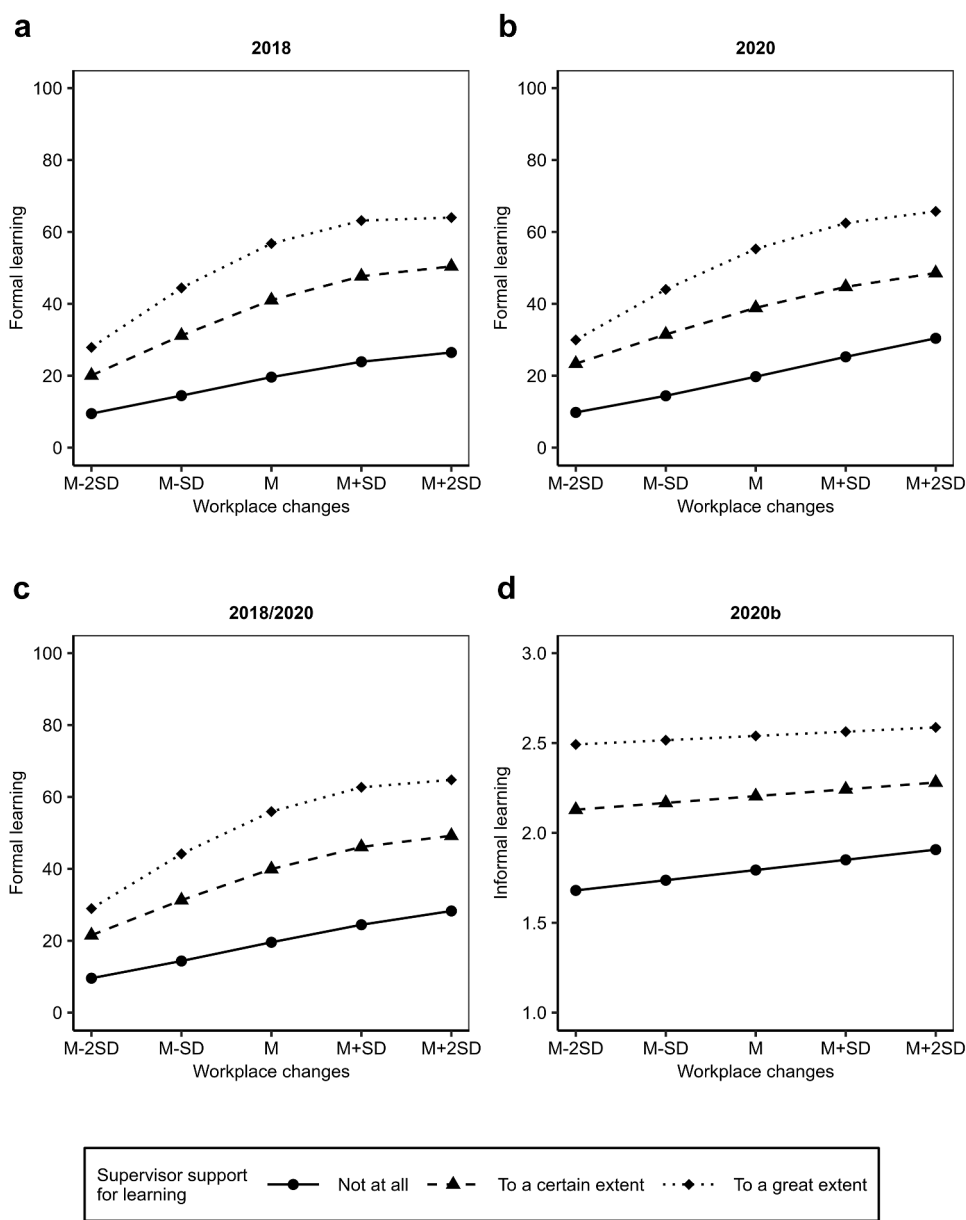


Figure 2. The moderating effect of supervisor support for learning on the nonlinear relationship between workplace changes and formal learning (a, b, c) and on the linear relationship between workplace changes and informal learning (d).

two dummy variables representing supervisor support. Results show a significant moderating effect of supervisor support for learning on the nonlinear relationship between workplace changes and formal learning for the 2018 sample (Log-odds = -0.04 , $\beta = -0.06$, $p = .022$; Figure 2a) and for the 2018/2020 sample (Log-odds = -0.04 , $\beta = -0.05$, $p = .006$; Figure 2c). The interaction effect was not significant in the 2020 sample (Figure 2b).

To assess the curves of the interaction in more detail, we conducted simple slope tests. We tested the simple slopes for low ($-2SD$), moderate (*Mean*) and high levels of workplace changes ($+2SD$) on the probability of formal learning (cf. Caniëls et al., 2021). For the curve of low supervisor support, the simple slope at low levels of workplace changes ($-2SD$) was positive (2018: $\beta = 0.539$, 95%CI [0.359, 0.718]; 2020: $\beta = 0.469$, 95%CI [0.270, 0.669]; 2018/2020: $\beta = 0.504$, 95%CI [0.370, 0.638]), the simple slope at moderate levels of workplace changes was positive but weaker (2018: $\beta = 0.309$, 95%CI [0.260, 0.358]; 2020: $\beta = 0.348$, 95%CI [0.298, 0.398]; 2018/2020: $\beta = 0.329$, 95%CI [0.294, 0.364]), and the simple slope at high levels of workplace changes ($+2SD$) further declined in strength but remained significant in two samples (2018: $\beta = 0.08$, 95%CI [-0.040, 0.199]; 2020: $\beta = 0.227$, 95%CI [0.082, 0.371]; 2018/2020: $\beta = 0.154$, 95%CI [0.061, 0.247]). For the curve of high supervisor support, the simple slope at low levels of workplace changes was positive (2018: $\beta = 0.842$, 95%CI [0.672, 1.011]; 2020: $\beta = 0.686$, 95%CI [0.517, 0.855]; 2018/2020: $\beta = 0.759$, 95%CI [0.639, 0.880]), the simple slope at moderate levels of workplace changes continued to be positive (2018: $\beta = 0.381$, 95%CI [0.334, 0.428]; 2020: $\beta = 0.375$, 95%CI [0.332, 0.417]; 2018/2020: $\beta = 0.376$, 95%CI [0.345, 0.408]), but the simple slope at high levels of workplace changes was no longer significant (2018: $\beta = -0.080$, 95% [-0.191, 0.032]; 2020: $\beta = 0.064$, 95%CI [-0.062, 0.189]; 2018/2020: $\beta = -0.007$, 95%CI [-0.091, 0.077]). Thus, Hypothesis 3a is partly supported. Hypothesis 3b was not supported because earlier results did not reveal a nonlinear relationship between workplace changes and informal learning.

Exploratory analysis

Although the nonlinear relationship between workplace changes and informal learning was not significant, a significant linear relationship was found. We explored the moderating effect of supervisor support on this linear relationship. Results showed that supervisor support for learning moderated this relationship (2020b: $b = -0.03$, $\beta = -0.06$, $p < .001$; see Table 3, Model 4). Simple slope analyses revealed that for low supervisor support for learning, the simple slope was positive (2020b: $\beta = 0.046$, 95%CI [0.035, 0.058]). When supervisor support for learning was high, the simple slope was still positive (2020: $\beta = 0.019$, 95%CI [0.010, 0.029]), but significantly weaker, as indicated by non-overlapping confidence intervals. Hence, workplace changes were less strongly associated with informal learning when supervisors stimulated learning compared to when they did not. As shown in Figure 2(d), under conditions of high supervisor support for learning, employees were more likely to engage in informal learning and they were less influenced by workplace changes.

Discussion

This study shows that workplace changes are positively related to employee learning, both formal and informal. That is, people who experience a high number of workplace changes also indicate higher engagement in learning. For formal learning, this relationship was nonlinear, resembling a positive curve that gradually flattens: participation in learning activities decelerated when multiple workplace changes occurred

at the same time. For informal learning, this relationship was linear rather than nonlinear: participation in learning activities increased with the number of workplace changes.

This study further shows that supervisor support for learning plays a significant role in both employee formal and informal learning: high supervisor support was strongly and positively related to both types of learning. Even moderate levels of supervisor support had a positive impact, though to a lesser extent. Under conditions of high supervisor support, the relationship between workplace changes and formal learning was strongly positive with a relatively steep incline in formal learning, although this association became weaker when workplace changes further increased. The same pattern was found for the linear association between workplace changes and informal learning: workplace changes had less impact when supervisors provided more support. Notably, the strength of the association between workplace changes and formal learning under conditions of low and high supervisor support was most prominent when workplace changes were low ($-2SD$). This supports the idea that when there are few workplace changes, supervisors have a crucial role in stimulating formal learning. Altogether, these findings provide valuable insights into how workplace changes, supervisor support, and learning are connected.

Theoretical implications and future research directions

Our study has several theoretical implications. First, our study shows that the likelihood of engaging in both employee formal and informal learning increases as workplace changes increase. Unexpectedly – and in contrast to recent research on work design principles and learning that has speculated on accelerating effects (Noe et al., 2014; Parker, 2017; Parker & Grote, 2020) – the results also suggest that the relationship between workplace changes and formal learning follows a decelerating rather than accelerating trend: the positive effect on formal learning diminished as employees experienced an increasing number of workplace changes. In other words, while workplace changes generally enhance engagement in learning, there appears to be a tipping point where additional changes no longer boost, and may even hinder, participation in formal learning.

Second, our study finds that the distinction between formal and informal learning goes beyond their characteristics and outcomes to encompass their antecedents. While work design theory suggests that workplace changes prompt participation in both types of learning, our study reveals differing patterns. Specifically, we observed an initial rapid increase in formal learning participation with workplace changes, potentially surpassing that of informal learning activities. This trend could stem from increased attractiveness or urgency in facilitating structured learning activities amidst multiple workplace changes, prompting employees to prioritise investments in learning via formal learning programmes. This aligns with Nikolova et al. (2016), who stress the organisation's role in supporting and safeguarding employee learning, especially during periods of work restructuring. However, our findings go further, showing that while formal learning initially accelerated, it eventually plateaued, whereas participation in informal learning continued on a steady upward trajectory.

The positive yet decelerating pattern for formal learning versus the positive linear pattern for informal learning may be attributed to the nature of these types of employee learning. Formal learning requires considerable time and resources and is orchestrated by organisations to align with organisational objectives, while informal learning is more accessible, less costly, and often spontaneous as workers encounter new challenges (Cerasoli et al., 2018; Manuti et al., 2015). Given its costly and time-consuming nature, workplace changes may stimulate formal learning only to a limited extent, with a point of saturation at which additional changes may not further increase the motivation, necessity, or likelihood to participate in formal learning. Multiple workplace changes may create high pressure and demands for employees, limiting engagement in costly learning activities (Cerasoli et al., 2018). Some scholars suggest that only moderate levels of demands prompt learning (e.g. Wielenga-Meijer et al., 2010), while excessive demands can overwhelm workers (Bakker & Demerouti, 2017). Conservation of Resources Theory (Hobfoll et al., 2018) posits that high demands deplete resources, impairing information processing and reducing employees' willingness to learn (Eysenck & Calvo, 1992; Warr & Downing, 2000). Consequently, under conditions of multiple workplace changes, employees may be less inclined to engage in formal learning activities that require substantial resource investment, preferring less resource costly and less time-consuming informal learning activities.

Third, our study emphasises the crucial role of supervisor support for learning in fostering employee participation in formal and informal learning activities, especially during times of change. Supervisor support significantly enhances employee participation in formal learning programmes and increases their likelihood of informal learning from tasks and colleagues. This aligns with literature highlighting supervisors' influence in promoting both types of learning (e.g. Birdi et al., 1997; Cerasoli et al., 2018; Colquitt et al., 2000; Gerards et al., 2020; Tannenbaum et al., 2010). Notably, we found a relatively strong positive relationship between workplace changes and formal learning when supervisors encourage employee learning: well-supported employees showed high engagement in formal learning activities even with few changes, quickly scaling up, though this positive relationship weakened with more workplace changes.

The intriguing finding that supported employees engaged in formal learning even during periods of minimal workplace changes, where an immediate imperative may not exist, prompts deeper exploration. From a motivational perspective, studies on supervisor support and learning assume that social support motivates discretionary learning activities, which can be reinforced and encouraged by others (cf. Parker et al., 2021). Our results align with Nikolova et al.'s (2016) conclusion that an appreciation learning climate – offering incentives for learning – motivates employees to learn even when new skills are not urgently needed. However, our findings suggest that workplace changes and supervisor support might stimulate employee motivation to participate in formal learning in complementary ways. While workplace changes primarily stimulate extrinsic learning motivations – addressing skill gaps and productivity – supervisor support fosters intrinsic motivation, accelerating learning participation. This stimulation of intrinsic motivation can lead to proactive learning behaviours, resulting in a rapid and steep increase in formal learning activities when combined with initial workplace changes.

Although speculative, these insights underscore the role of leadership in fostering employee learning amidst workplace changes.

Practical implications

This study offers two concrete, actionable insights on how HRM and managers can effectively manage and leverage workplace changes to enhance employee learning and development. First, our findings emphasise the importance of considering the timing and nature of learning initiatives to stimulate employee development during workplace changes. We found that workplace changes are associated with both formal and informal learning. However, too many changes did not further stimulate employees' engagement in formal learning. Thus, investing in formal learning programmes is most valuable when the amount of workplace changes is moderate. During periods of relative stability (i.e. no or few changes), supervisors play a crucial role in stimulating employees in both forms of learning. Notably, many workplaces benefit from a balanced combination of both formal and informal learning approaches, as these cater to different types of knowledge acquisition (Manuti et al., 2015).

Second, our study revealed that supervisor support for learning had a direct positive influence on formal and informal learning, while also enhancing the learning-inductive properties of workplace changes. Consequently, training and guiding supervisors to actively support and encourage employee learning is a valuable investment before and during workplace changes. Supervisors should communicate clear expectations that the organisation values continuous learning (Ellström & Ellström, 2014). Additionally, providing developmental feedback can stimulate workplace learning and enhance employees' self-regulation regarding self-improvement and development (Kluger & DeNisi, 1996). Establishing a culture of learning support among supervisors (i.e. an appreciation culture, cf. Nikolova et al., 2016) can yield significant benefits for overall employee development (Garvin, 2000). It is important to acknowledge, however, that not all associations in the current study were consistent across various samples, underscoring the need to customise leadership development approaches to specific contextual factors.

Limitations and directions for future research

This study has several limitations and methodological considerations. First, our study relied on self-report data from the NWCS. Using self-reports to measure objective workplace conditions (i.e. workplace changes) may have introduced measurement inaccuracies (Spector & Jex, 1991). Furthermore, the cross-sectional data also prevents us from establishing causality, even though our theoretical rationale argues for a causal relationship (i.e. workplace changes predict employee learning; supervisor support predict learning), consistent with prior research (Blume et al., 2010; Colquitt et al., 2000; Knight & Parker, 2021; Parker, 2014). Yet, it is possible that employee learning can instigate workplace changes or increase supervisor support. Additionally, our data cannot rule out the influence of third variables, such as an organisational culture promoting innovation, on both employee learning and experienced workplace changes. Conducting longitudinal studies or natural experiments could offer more conclusive evidence.

Second, we did not explore how different combinations of multiple workplace changes affect learning. Previous work design research emphasised that integrating diverse work characteristics may particularly prompt learning. Specific combinations, such as autonomy, demands, complexity, and feedback, can enhance knowledge acquisition through cognitive or motivational processes (Parker et al., 2021). This suggests that the significance of workplace changes for learning may vary based on specific work characteristic alterations, individual motivations, or contextual factors. Future research could investigate interactions between different workplace changes, thereby advancing our understanding of the relationship between workplace changes and employee learning. Relatedly, although it is generally assumed that certain workplace changes may impact multiple work design characteristics, we did not actually measure these characteristics. Future research should investigate which individual work design characteristics are affected by workplace changes.

Third, workplace changes seem to stimulate employee learning, but it is crucial to recognise that our results suggest that too many changes can overwhelm employees, making it harder to engage in learning activities (Cerasoli et al., 2018; Parker et al., 2021). This finding calls for further investigation. Earlier studies indicate that excessive demands can overload workers, impairing cognitive information processing and, consequently, learning (e.g. Bakker & Demerouti, 2017; Hobfoll et al., 2018; Warr & Downing, 2000). Thus, when faced with numerous workplace changes, employees may experience cognitive overload, hindering learning. Investigating information overload as mediating mechanisms for the nonlinear relationship workplace changes and learning could offer valuable insights.

Lastly, while our NWCS data provides a large and representative sample of the Dutch labour force, the measurement scales had a limited number of items to ensure high response rates. This decision involved a trade-off with more comprehensive measurements. Also, we used relatively general measures for assessing workplace changes and formal learning. For instance, we asked respondents whether they had participated in a formal training programme, while such programmes can vary widely in format and content, duration, frequency, and relevance to the work context. Hence, our findings warrant caution in advising specific formal learning activities. Regarding workplace changes, we inquired whether participants had experienced four types of changes but did not assess their impact or severity. For future research, we recommend using measurement instruments with more items to enhance measurement precision and to provide a more fine-grained picture.

Conclusion

In conclusion, this study illuminates the complex relationship between workplace changes, supervisor support, and employee learning. The key findings reveal that workplace changes can serve as motivational sources for both formal and informal employee learning, although for formal learning only up to a certain point. Supervisor support for learning emerged as a significant factor for work-related learning, strongly influencing employee learning itself and also boosting the motivational force of workplace changes for formal learning. Despite limitations, this study

provides actionable insights and opens avenues for future research, enhancing our understanding of the interplay between workplace dynamics, support, and employee learning.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability

The raw data supporting the conclusions of this manuscript will be available to any qualified researcher from the second author upon request.

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