Effects of age, gender, and occupation on perceived workplace learning support

Keywords:

Workplace learning,

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Abstract

The provision of workplace support is central to how and what is and can be learnt at work. Hence, the distribution of those experiences is an important factor in the quality of workplace learning experiences. The study reported and discussed here aims to identify differences in levels of support and opportunities for applying knowledge in workplaces among factors of age-, gender-, and occupation-related cohorts of employees across a range of levels of employment. A convenience sample of 459 employees (i.e. 224 men and 231 women) from different occupations, companies, and workplaces participated in this cross-sectional exploratory study. Comparisons between categories of age and occupation are based on the non-parametric Kruskal-Wallis test and comparisons regarding gender are performed with the non-parametric Mann-Whitney U-test. The results propose that for this sample neither age nor gender, but the level of employment is the crucial factor. Put simply, the evidence suggests that those in better jobs, regardless of age or gender, receive more support for workplace learning.

Keywords: Workplace learning, informal learning, non-formal learning, ISCO, gender, occupation, age

Introduction

Over the past four decades, changes in economic and societal factors have reshaped the nature of work. Together, these changes have had crucial impacts on labour markets in countries with advanced Western industrialized economies (e.g., Green, 2007). There has been a significant shrinkage of employment in primary and secondary industrial sectors. Yet, whilst the demand for manual work has declined, significant growth has occurred in service related, para-professional and professional areas of work (CEDEFOP, 2010). Also, the combination of accelerated technological advancements and increasing global competition leads to products and work processes having shorter life cycles (Green, 2007). Hence, with more frequent changes there are fewer routine tasks and employees now need the ability to adapt to new work processes, including new technologies and tools (Billett, 2009, 2014). Consequently, permanent work-related change is now the rule rather than an exception, as are the needs for significant ongoing learning to sustain employability. Hence, initial training, albeit secondary/vocational or tertiary education, cannot prepare individuals for all future work requirements. Instead, all categories of employees will be required to engage in learning to meet the ever-changing demands of their workplaces.

It follows that the support for ongoing learning in working life is becoming increasingly important for securing the kinds of learning outcomes that both workplaces and employees want and need. However, it is known that the access to institutionalized learning opportunities is far from equal. Empirical evidence indicates that older employees experience less development opportunities (i.e. access to training programs) than their younger counterparts (e.g., Büsch, Dahl, & Dittrich, 2009; Lazazzara & Bombelli, 2011), and women have fewer career-related opportunities, even when in the same work as males (Korpi, Ferrarini, & Englund, 2013; Ziegler, Gartner, & Tondorf, 2010). Furthermore, it is the more educated, working in more prestigious jobs that is more likely to receive access to work-related development (e.g., Roosmaa & Saar, 2010; Seifried & Berger, 2011; Thomas & Qiu,

2012). Hence, despite being required by all employees the distribution of development opportunities appears to be not evenly distributed.

However, work-related learning is not constrained to training and other kinds of institutional development programs. Development potentials also emerge when employees have opportunities to engage in rich work-related activities and interactions that permit discretion (e.g., Billett, 2001a; Engeström, 2001; Eraut, 2000, 2004). Learning for work, therefore, is also shaped by how organizations design jobs and workplaces. In traditional, more 'top-down' oriented work organizations, employees are in charge of strictly pre-defined subtasks and are usually closely supervised and exercise very limited discretion. Yet, in contemporary conceptions of workplace organization, a new paradigm has been introduced based on three key premises (Appelbaum & Gallagher, 2000; Harteis & Gruber, 2004). First, employees need to exercise some degree of autonomy and control over job tasks and methods. Hence, their jobs are redesigned to enable employees to make work-related decisions. Second, employees are expected to participate in problem-solving and improving production techniques; thus, they need the capacity to identify and resolve problems and communicate solutions to colleagues. Third, workplaces are organized around self-regulated teams directly involved in work processes, and through offline problem-solving and quality-improvement teams not directly involved with everyday working processes. Learning for and through these processes is important for organizing and advancing the viability of these workplaces. Employees are, therefore, understood as an important key to successful operational and organizational development and are expected to cope with new demands. An emerging trend is for these ideas to be applied to all kinds of work and occupations. However, the question arises whether these ideas and demands are fully implemented in contemporary work organisations and whether work arrangements that support workplace learning are then actually accessible to all employees irrespective of age, gender, and type of work.

This study, therefore, investigated whether workplace learning support, i.e. workplace characteristics that support learning at work, is – similar to more institutionalized development opportunities – unequally distributed within the workforce due to gender, age,

and occupational differences. A convenience sample of 459 German employees from different occupations, companies, and workplaces voluntarily completed a self-report questionnaire on perceived workplace learning support as a means to illuminate and quantify responses to this question. However, before presenting and discussing the method and the empirical findings in detail, some premises for considering workplace learning and perceived workplace learning support as well as prior research on the above mentioned inequalities need to be set out.

Workplace learning and its support

Much theoretical and empirical effort has been invested to identify and test the characteristics of work environments that either foster or hinder learning through everyday activities (e.g., Billett 2001a; Fuller & Unwin, 2004). One theoretical rationale to derive such characteristics that has been used in the past (e.g., Gijbels, Raemdonck, & Vervecken., 2010; Gijbels,

Donche, Van den Bossche, Ilsbroux, & Sammels, 2014) is Karasek's Demands-Control-Support (DCS) model (Johnson & Hall, 1988; Karasek, 1979; Theorell & Karasek, 1996).

The model proposes that workplaces combining highly demanding work activities, high levels of job control, and high social support afford high levels of learning opportunities for their employees. The theoretical precept is that employees with challenging work conditions have the best opportunities to develop appropriate coping strategies in environments that allow them to try out new problem solving strategies (Gijbels *et al.*, 2010). Access to interactions and support in workplaces reinforces this effect by allowing employees to secure feedback about newly developed work behaviours, and opportunities to discuss, develop, and appraise strategies that can respond to workplace challenges. Based on this rationale and on a synopsis of theoretical and empirical work in the field of workplace learning, Rausch (2012) proposed an operationalization of that model that relates to the three main job characteristics included in the DCS-model: (a) work demands (i.e. task significance, task variety, task complexity, information processing and problem solving), (b) the control provided (i.e.

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planning autonomy, decision autonomy and methods autonomy) as well as (c) social support of the work environment (i.e. feedback and interaction).

There is strong empirical evidence that workplaces differ in their support and inherent potential for learning. Studies reveal rich potential for some workplaces, but limited potential for others (e.g. Billett, 2001a; Evans, Hodkinson, Rainbird, & Unwin, 2006; Harteis & Gruber, 2004; Munro, Rainbird, & Holly, 2000). Furthermore, it has also been pointed out that the access to learning affordances at work are often taken up in different ways based on individual characteristics, such as demographic variables, interest, capacities, and needs (Billett, 2001b; Kyndt, Dochy, & Nijs, 2009). These studies on work-related learning, therefore, suggest that workplaces' learning potentials depend on both workplace-related and individual factors (Kyndt & Baert, 2013; Nieuwenhuis & van Woerkom, 2007). So, it is important to be account for how both individual factors like age and gender as well as more situational factors like the occupational standing of an individual determines the access to opportunities for learning through work.

Factors influencing workplace learning

Age

Older employees, usually defined as being older than age 50, are often subject to negative societal sentiments (Chiu, Chan, Snape, & Redman, 2001; Gordon & Arvey, 2004; Kite, Stockdale, Whitley, Johnson, 2005; Ng & Feldmann, 2008, 2012). These comprise prejudices about work performance (Gordon & Arvey, 2004; Kite *et al.*, 2005; van Dalen, Henkens, & Schippers, 2010), their alleged resistance to change (Rosen & Jerdee, 1976; Chiu *et al.*; 2001) and ability to learn (Brooke & Taylor, 2005).

Posthuma and Campion's (2007, 161) review of literature about the empirical basis for those stereotypes conclude "there is little evidence that job performance declines as employees get older". Conversely, Lallemand and Rycx (2009) claim that older employees are detrimental to workplace productivity, particularly in information, communication and technology firms. Otherwise, older employees are as able to work under pressure as younger

counterparts. Brewer and Shapard's (2004) meta-analysis also revealed a negative relationship between employee age and burnout (exhaustion). Similarly, Johnson, Holdsworth, Hoel, and Zapf (2013) concluded that older employees make more effective use of stress management strategies. Therefore, the empirical evidence is far from conclusive that older employees are deficient, less productive, and less worthy of opportunities for developing further their occupational capacities than younger counterparts.

Nevertheless, many supervisors and human resource managers still hold negative stereotypes about older employees. In the German context, Verworn (2012) and in the Dutch context, van Dalen *et al.* (2010) found that university students, employees and employers attributed less positive work characteristics to older employees in comparison to younger ones. It seems that even almost after 40 years the seminal findings of Rosen and Jerdee (1976) are still valid. In their experimental study they found that individuals in supervisory positions think that older employees are less creative, less able to change, and less interested in technological progress. This might therefore explain why managers view older employees as 'last resort' employees (Billett, Dymock, Johnson, & Martin, 2011), and why they are unwilling to hire or promote them, or invest in their training (Büsch *et al.*, 2009; Lazazzara & Bombelli, 2011; Wrenn & Maurer, 2004).

Based on qualitative interview data Bender (2010) claims that such attitudes not only lead to age discrimination in recruitment and allocation of training opportunities, but also to age-biased work organization. She found that innovative and demanding tasks are more often delegated to younger employees because it is assumed that they are more flexible, more creative and have more interest in such tasks. Older employees, on the other hand, get tasks assigned where they already know what to do (see also Thijssen, 1992). These arguments are supported by findings reported from Tikkanen (2002), who found that older engineers describe their work as less challenging and mostly consisting out of routine tasks.

In terms of the general relationship between perceived learning opportunities at work and age, Schulz and Stamov Roßnagel (2010) found a small but significant relationship in their sample of 900 German employees. In another study, Coetzer (2007) used self-reports to

investigate employees' perceptions of the learning potential of their workplaces and found that employees with less than two years tenure and younger employees (i.e. those between 18 and 24 years old) experienced more supervisor support than did relatively older employees (35 to 44 years) and employees with a longer tenure (six years or more). Kyndt *et al.* (2009) surveyed employees of different age groups across 31 different organisations to explore whether they have different opportunities for learning. They reported that older employees benefitted more from "feedback and knowledge acquisition" (e.g., obtaining feedback from colleagues and supervisors, discussing work-related matters, access to important reports) than did younger employees. However, not surprisingly, older employees indicated that they saw lower value in "being coached", than did younger counterparts. Concerning other interactions at work, Richter, Kunter, Klusmann, Lüdtke and Baumert (2011) reported that teachers tended to collaborate less with colleagues the older they were, while Van der Heijden, Boon, van der Klink and Meijs (2009), analogously, reported that age was significantly negatively related to employees' networking behaviour within the own organisation (a university), in which networking activities mainly comprised information exchange concerning what was happening in the organisation.

Supervisor and manager positions that include a wide range of decision-making authority and job control in general are often rewarded on the basis of seniority. Therefore, it might be assumed that job control characteristics and age should be positively related. However, empirical results show contradicting evidence. Warr and Fay (2001) found a negative but not significant correlation between job control and age in one German sample and a zero correlation in another. A small positive relationship between age and job control was found by Turner, Chmiel and Walls (2005) for railway employees in the UK as well as in a Belgian sample of employees between 50 and 59 (Desmette & Gaillard, 2008). Bos, Donders, Bouwman-Brouwer and Gulden (2009), on the other hand, report a U-shaped relationship between age and job control for Dutch university employees.

In sum, the empirical evidence of how employees of different ages perceive potential of their workplaces as fostering or hindering their learning is equivocal. However, negative

stereotypes about older employees may lead to certain kinds of task discrimination that then result in reduced workplace learning support for these employees.

Gender

Given the gender segregation seen in most professions, the attempt to disentangle gender from occupational influences on perceived workplace learning support leads to particular difficulties. However, some empirical evidence about general gender effects is available. A well-known and much-discussed phenomenon is that women are still highly under-represented in managerial positions (for the German context: Kohaut & Möller, 2010; Körner & Günther, 2011) that are usually characterised by high levels of job control and job demands. Some researchers attribute this phenomenon to a so called ‘glass ceiling’, which is defined as a non-visible barrier that keeps women from entering supervisor positions regardless of their competence, qualifications, and past achievements (U.S. Glass Ceiling Commission, 1995). However, researchers have attributed those gender differences to the different study choices made by males and females, as well as the career interruptions arising from maternity leaves that impede women’s promotion (Ochsenfeld, 2012). Furthermore, women with children tend to work more often in part-time positions (Domenico & Jones, 2006; Hakim, 2006) that can lead to task discrimination because high-priority and high discretionary work is more often allocated to full-time employees (Williams & Segal, 2003). This could also be a reason why some women experience less task variety, less task complexity, less task significance, and less decision and planning autonomy at work. However, empirical evidence to support such claims is rare. Casini *et al.* (2013) find only very small differences between Belgian men and women in their experiences of job demands and controls at work. On the contrary, Coetzer (2007) even found that women experience significantly more opportunities to learn new tasks because their work offers a higher task variety than for their male counterparts.

Ambiguous findings also exist for gender effects on the provision of social support at work. Van der Heijden *et al.* (2009), for example, found that female employees interact

significantly more often with their supervisors at work. This might result in more feedback and more work-related exchange of information for women than for their male counterparts. Higher general social support at work for female employees was identified by Casini, Godin, Clays and Kittel (2013) but the effect size was negligible. No differences in the perceived supervisor and co-worker support between men and women were found in a sample of four organizations in the United States. ($n=116$) (Geller & Hobfoll, 1994). Other authors (e.g., Timberlake, 2005), on the other hand, argue that women face problems to gain and exploit social capital at work. Brass (1985), for instance, reports that women were often excluded from certain informal networks, meaning their access to work-related information was limited in comparison to their male colleagues. Tanggaard (2006) argues that women may especially be excluded from work- and non-work-related discussions in male-dominated domains. So, on balance, there is evidence on advantages for both men and women, but all of these are mediated by workplace factors, such as task allocations and work-related interactions.

Occupational standing

Occupational standing is an important predictor of perceived workplace learning support. An occupation is defined as a “set of jobs whose main tasks and duties are characterised by a high degree of similarity” (International Labour Office, 2012, 59, emphasis removed). The International Labour Office (2012) distinguishes between ten major groups of occupations (e.g., Managers, Professionals, Service and sales workers, Plant and machine operators, and assemblers, Elementary occupations) based on general skill-level and skill specialization required to perform the tasks and duties connected to an occupation. Such sentiments extend to how development within occupations is considered and the kinds of opportunities identified for those purposes.

Pelfrene *et al.* (2001) investigated the relationship amongst those ISCO occupation groups (ISCO = International Standard Classification of Occupations; Ganzeboom, de Graaf, & Treiman, 1992) and the average experienced job demands, job controls and work-related social support in a large-scale study with 21,419 Belgian participants. Their findings show

that for both men and women the membership in a higher-classified occupation leads to both more job control and job demands; a consequence assumed to be conducive to work-related learning. Only ISCO-group 7 (i.e. crafts and related trades workers) seems to be an exception. In particular, males in this group experience similar job demands as their colleagues in the groups 4 (i.e. clerical support workers) and 5 (i.e. service and sales workers). Perceived workplace support did not vary greatly across different occupation groups, except for service and sales worker that consistently reported lower mean scores for both supervisor and co-worker support.

On the other hand, a number of smaller studies have identified conflicting findings about the experiences of workplace learning support amongst occupation and status groups. For instance, Coetzer (2007) finds that employees in supervisor positions experience their daily tasks in general as more challenging. However, the differences between supervisors and non-supervisors were relatively small. Hicks, Bagg, Doyle and Young (2007) compared trainees, managers and owners in public accounting in New Zealand and suggested that owners and managers have more job control, can experiment more with their work and are more flexible in their daily work routines. Concerning social support at work, Ashton's (2004) qualitative study conducted in the United Kingdom concludes that employees higher up the hierarchy have more access to work-relevant information due to their access to appropriate networks. In contrast, Bauer, Festner, Gruber, Harteis and Heid (2004) could not find any differences in supervisor's and staff member's general appraisal of workplaces as supportive learning environments in a range of different German companies across various industries. So, there are patterns and ambiguities in the relations between workplace support for learning and the occupations of the informants that might extend to cultural factors and how these differ across nation states (e.g. UK and Germany).

Research questions

The heterogeneity of research findings presented above can be partly explained by the focus on specific areas of work, companies, or workplaces the individual studies adopted. Hence,

the findings cannot be held to represent workplaces in any general sense. Here, the attempt is to focus on workplace learning support over a *range* of different workplaces in various organisations and industries.

Furthermore, only a few studies have investigated the allocation of characteristics that foster workplace learning in German organizations. The central aim of the study reported here is to consider whether age and gender differences in workplace learning support for specific areas of employment exist in a German sample. In this cross-sectional exploratory empirical study, the following questions are addressed:

1. Does perceived workplace learning support differ between age groups?
2. Does perceived workplace learning support differ between genders?
3. Does perceived workplace learning support differ between occupation groups?
- 4.

Method

To address the above research questions a cross-sectional questionnaire study was conducted with German employees in 2012. In the following section, we describe participant characteristics, the questionnaire instrument and methods of data analysis used in this study.

Participants

A convenience sample of 459 employees from a range of occupations, companies, and workplaces voluntarily completed the questionnaire. The sample comprised 224 men and 231 women; with four respondents not indicating gender. University students participating in a course on education recruited the sample. All students were thoroughly instructed to each recruit three employees in their wider circle of acquaintances. The instruction also emphasised that potential participants should be recruited from a range of industries and organisations. Participants then anonymously completed a questionnaire survey; in the first section they were asked to provide information on age, gender, and occupation as free text. The range of occupations represented in the sample was classified according to the International Standard Classification of Occupations 2008 (ISCO-08) ranging from 1 =

managers over 5 = service and sales workers to 9 = elementary occupations (International Labour Office, 1990, 2012; see also Ganzeboom *et al.*, 1992). In 37 cases, a classification was not possible due to either imprecise or missing information. The distribution of ISCO classes in our sample indicates higher-status occupations are overrepresented in the sample while the age class of 31 to 40 year old participants appears slightly underrepresented (see Table 1). Altogether, only four participants could be classified as either “Skilled agricultural, forestry or fishery workers” or in “Armed forced occupations”. Due to the very small number of cases falling in either of the two ISCO classes, these four participants were excluded from any further analyses.

[TABLE 1 ABOUT HERE]

Questionnaire data

In the second section of the questionnaire participants were asked about task characteristics for workplace learning support (see below). This was based on a German questionnaire previously used by Rausch (2012).

The questionnaire is a combination and adaptation of scales from German versions of several questionnaires on workplace characteristics (MIZEBA, Zimmermann, Wild, & Müller, 1994; Work Design Questionnaire, German version by Stegmann *et al.*, 2010; Job Diagnostic Survey, German version by Schmidt, Kleinbeck, Ottmann, & Seidel, 1985) supplemented by some new scales that were tested and further developed in studies of learning in workplaces (Rausch, 2012). The following self-reporting scales were included in the questionnaire:

- Task significance: This scale measures how important and meaningful an employee perceives his job (5 items, e.g. “I have to work on tasks and problems that are really important for the whole organisation”).
- Task variety: Task variety measures how diversified an employee’s job is (4 items, e.g. “My work is very diverse”).

- Task complexity: This construct measures the complexity of an employee's job (3 items, e.g.: "The tasks I work on are simple and relatively straightforward").
- Information processing: This scale measures how much cognitive processing a job requires (4 items, e.g. "My job requires much mental efforts").
- Problem solving: This scale measures to what extent an employee has to find solutions to yet unknown problems (4 items, e.g. "My job requires unconventional ideas or problem solving").
- Planning autonomy: This scale measures to what extent an employee can freely plan its steps to accomplish a given task (3 items, e.g. "I am free to decide in what order I do my job")
- Decision autonomy: This scale measures the decision scope an employee has at work (3 items, "My job allows me to make a range of own decisions").
- Methods autonomy: This scale measures to what extent an employee can decide in what way a task or problem can be tackled (3 items, e.g. "I am free to decide by what means I complete a task").
- Feedback: This scale measures how much information a workplace provides concerning the quality of tasks and problem solutions (5 items, e.g. "I usually know whether I did a job in a satisfying way").
- Interaction: This scale measures to what extent a workplace requires employees to communicate and collaborate with each other (6 items, e.g. "To guarantee that everything works smoothly in my department even experienced colleagues exchange information all the time").

Task significance was measured on a 4 point Likert scale (1 = "does not apply at all"; 4 = "does fully apply"). All other scales were measured on a 5 point Likert scale (1 = "strongly disagree"; 5 = "strongly agree").

Overall, 0.32% values of the data were missing. The missing data can be assumed to be missing completely at random (Little's MCAR-test, $\chi^2 = 1178.1$, $p = .10$) and was imputed

by linear regression. Furthermore, a maximum value of 1.597 of the anomaly index indicated that there were no significant outliers.

Data Analysis

At first the data was checked to be eligible for any further analyses. As the assumption of normal distributed data was not upheld, comparisons between age classes and occupational classes are based on the non-parametric Kruskal-Wallis test and comparisons regarding gender are performed with the non-parametric Mann-Whitney *U*-test. Nevertheless, Eta Squares (η^2 , based on one-way ANOVAs) are reported as indicators of effect size and are interpreted carefully.

Findings

The findings here are presented in the form of descriptive statistics and effects of age, gender and occupational group on perceived workplace learning support

Descriptive statistics

Before addressing the research questions, a confirmatory factor analysis (CFA) with IBM SPSS AMOS v21 was conducted. The CFA was employed to test whether the theoretical measurement model (i.e. the assumed item to latent construct assignment) fits the actual data. Different fit indices are used to assess the fit of the theoretical model: Ratios of χ^2 and *df* below 3, *RMSEA* values below .08, and *CFI* values above .90 speak in favour of a proposed measurement model. For large datasets (i.e., $N > 250$) a significant χ^2 test ($p_{bootstrapped} < .05$) has to be expected and does not speak against the measurement model as long as the fit indices are above or below their respective cut-off values (Hair, Black, Babin, & Anderson, 2014).

The measurement model of this study showed a good fit ($\chi^2 = 1393.526$, $p_{bootstrapped} = .000$, $df = 695$; *RMSEA* = .047, *CFI* = .934). Both χ^2/df and *RMSEA* are well

below the proposed cut-off values. Additionally, CFI is above .9. We can, therefore, infer that the assumed measurement model does indeed fit the data.

[TABLE 2 ABOUT HERE]

Table 2 shows the descriptive statistics of the measured constructs. The mean values suggest that the scales show neither floor nor ceiling effects. We can see from the standard deviations that the variances for all scales are sufficiently large for further analyses. ‘Task significance’ and ‘Feedback’ have the lowest standard deviations in this sample. ‘Planning autonomy’ has the largest standard deviation. For all scales but ‘Feedback’ the whole range of potential answer options were used.

Cronbach’s alpha as an indicator of internal consistency of a scale is continuously good ($\alpha > .7$) except for ‘Feedback’ ($\alpha = .67$). However, we contained the ‘Feedback’ scale since the CFA showed a satisfying overall fit of the measurement model and the scale almost reached the proposed cut-off value of $\alpha > .7$ (Hair *et al.*, 2014). All in all, these analyses suggest that the data of this study can be used for further investigations.

However, Kolmogorov-Smirnov tests revealed that the assumption of normal distribution is violated. Parametric tests, therefore, cannot be used to answer the research questions. However, for this reason, all further analyses are based on non-parametric tests that do not require data to stem from a certain distribution.

Effects of age, gender and occupational group on perceived workplace learning support

Table 3 presents descriptive data for mean comparisons between age groups and the results of the non-parametric Kruskal-Wallis test as well as effect sizes based on ANOVA.

[TABLE 3 ABOUT HERE]

Overall, there are some significant group differences, but only small effects are found for age groups as predictors of perceived workplace learning support. Significant differences between the age groups are found for ‘Task significance’, ‘Task complexity’, ‘Decision autonomy’, and ‘Methods autonomy’. The differences show a similar pattern, with informants

in the age group 31-40 reporting conditions more conducive for learning and employees younger than 31 reporting less supporting work environments (except for 'Methods autonomy').

Regarding gender differences, only small differences were found between males and females concerning perceived workplace learning support. Mann-Whitney *U*-tests revealed that differences between men and women could only be observed for one construct. Males gave significantly higher ratings for perception of complexity than did females ($\chi^2 = 7.84$, $p = .005$). However, the effect size of this difference is negligible ($\eta^2 = .011$).

[TABLE 4 ABOUT HERE]

Table 4 presents descriptive data for mean comparisons between occupational groups and the results of the non-parametric Kruskal-Wallis test as well as effect sizes based on ANOVA. The analyses show that there are large and significant differences in perceived workplace learning support reported by participants in the different occupational groups. The differences in all constructs show a clear pattern: higher-status occupations offer a more learning-conducive workplace environment than lower-status occupations. Not only do all statistical tests indicate significant results, but some of the effect sizes are remarkably high. This means that large and meaningful differences between the appraisals of workplace learning support between the occupational groups could be observed. Only the extent of feedback received at work does not differ largely between the groups. All findings are discussed in the next section.

Discussion

The discussion progresses by addressing sequentially the research questions introduced above. Firstly, age-specific issues are discussed before focusing on differences regarding levels of employment and gender.

Age-specific findings

The findings do not indicate any considerable age discrimination regarding workplace learning support across this sample. When considering correlations between age and the main constructs of workplace learning support as indicated in Table 3 the correlation coefficients are very low, even in cases of significant correlations. Hence, no relevant relationship between employees' age and the learning support at their workplaces was found. This finding is on the one hand consistent with Dymock, Billett, Klieve, Johnson, and Martin's (2012) finding that white collar workers enjoy rich support for work-related learning processes during the entire career, on the other hand this finding contradicts reported stereotypes against older employees regarding lacking capabilities or lacking opportunities to actualize their capabilities in contemporary work environments (e.g., van Dalen *et al.*, 2010; Gordon & Arvey, 2004; Kite *et al.*, 2005; Nelson, 2002; Ng & Feldmann, 2008, 2012).

The current findings also indicate that older employees in this sample do not experience any advantage over younger employees. Their more extensive set of experiences as compared to younger employees does not influence their perceptions of workplace learning support. In a study in the field of nursing, Lammintakanen and Kivinen (2012) found advantages for older nurses regarding continuing professional development. Hence, it is important to be clear whether a specific occupation/profession, where specific demands and constellations may apply, or a cross-section of the entire field of occupations is being investigated. Additionally, the low correlation coefficients may result from a high variance within the sample. This supports the findings of Fenwick (2012) who conducted an interview study with older professional employees. She found that those older employees she interviewed behave strategically when engaging in professional activities.

Table 3 shows the findings of tests of differences when categorised by age groups. Here, similar findings are observed. Where significant differences are identified, their effect size is too small to indicate relevant age discrimination. The significant differences are found for the same main constructs where significant correlations are found. Additionally, the perception of task complexity differs significantly. In all these cases, the age group of 31-40 years indicates the highest means. This can be explained by the skewed distribution of age

classes and occupational level as indicated in Table 1. Within the group of 31-40 years, the majority are to be classified with ISCO code 1 or 2. This classification is only the case for this age group. Hence, the findings indicate that it is not the age per se, but occupational activities that shape opportunities and barriers for workplace learning. It is noteworthy here that the age distribution within the sample fits quite well the population of German workforce, particularly when regarding the percentage of older employees (that is 50 years and older): Their presence in the sample is 25.8% whereas within the population is 25.5% (Kroll, 2011).

Gender-specific findings

No significant differences in workplace learning support between men and women were observed across the data. The main reason might be that the sample is a cross-sectional selection of employees: The gender distribution differs across branches and occupation. In Germany, for example, women are in majority in the area of clerical support as well as in service and sales whereas in the areas of plant or machine operators and management, men are in the majority (Bundesagentur für Arbeit, 2013). Differences in workplace learning opportunities may mainly be related to gender-specific occupations (e.g., Tanggaard, 2006). Hence, in a cross-sectional sample such differences may disappear.

All of these findings contribute to the conclusion that factors beyond age and gender serves to distribute opportunities for the development of skills in workplaces. In particular, those factors appear to relate strongly to kinds of occupations in which individuals are employed.

Occupation-specific findings

The test for differences regarding the ISCO classification provides clear findings. Except for 'feedback', all the main constructs indicate significant differences, sometimes with (for field studies) considerable effect sizes. These differences were distributed in such a way that for all main constructs the highest means are to be found either in ISCO class 1 or 2. Similarly, the lowest means are to be found either in ISCO class 8 or 9. Hence, it is clear that the kind of

occupation individuals are participating in crucially shapes their opportunities for workplace learning. Again, this finding is consistent with studies conducted with older employees in both Australia and Singapore that found employees in higher status occupations (i.e. professional, para-professional, administrative) reported little in the way of age-related discrimination or constraints on opportunities for maintaining their employability (Billett *et al.*, 2011b; Dymock *et al.*, 2012). Indeed, some of these employees claimed that younger employees had more barriers to their continuity of employment and advancement than did older employees. In essence, this study concluded that age per se was not the issue for older employees. The standing of their occupation and level of education are crucial factors. It also suggests that government policies and organizational practices might need to focus on the needs of older employees in occupations that are low status and for those with low levels of education (for EU policy see Roosmaa & Saar, 2010).

Although data on the participants' educational level are not available, one may assume that these findings reflect the influence of employees' levels of education on workplace learning opportunities. Whilst Livingstone (2010) cautions direct relations between levels of education and kinds of employment, because different socio-economic backgrounds provide differing opportunities for utilizing education on the labour market, his findings were about under-utilization of skills.

Research limitations

The study described and reported here attempted to investigate workplace learning support cross-sectionally. The findings consistently indicate that age and gender play only a minor role for the perception of workplace learning support, but that the nature of the occupation has an impact on workplace learning support.

Therefore, while the findings provide insights into the influences on subjective perceptions of workplace learning support, this empirical study has particular limitations that need to be considered when interpreting the findings.

First, individuals were grouped using the ISCO classification scheme, while neglecting to take into account actual work context factors. This will be an important aspect to consider in the design of future research.

Second, the study aimed at identifying differences in workplace learning support on group level, even though it is to be considered that within these groups differ in the actual work environments exist which both strongly support or hinder workplace learning activities. Furthermore, workplace learning support is – as described above – construed theoretically by task characteristics within this study. Also, nothing is said here about characteristics of particular learning activities that may also be interesting to investigate. However, a general limitation of questionnaires is that subjects may apply different understandings of learning and learning activities which may cause biases in the data and findings (Simons & Ruijters, 2001). Finally, this study did not consider individual psychological characteristics (e.g., self-efficacy, extraversion of the employees) that are crucial for workplace learning.

This finding presents an interesting starting point for further research which may also focus issues that were outside of this study's scope.

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Table 1. Sample distribution for age and ISCO classification

ISCO classes	Age classes				<i>Total</i>
	< 31	31-40	41-50	> 50	
1 = Managers	5	10	19	16	50
2 = Professionals	34	21	22	30	107
3 = Technicians and associate professionals	36	6	28	18	88
4 = Clerical support workers	7	3	6	3	19
5 = Service and sales workers	35	5	10	18	68
6 = Skilled agricultural, forestry, fishery workers	0	0	1	1	2
7 = Craft and related trades workers	9	7	10	11	37
8 = Plant and machine operators, and assemblers	3	2	8	4	17
9 = Elementary occupations	10	2	12	8	32
0 = Armed forces occupations	1	1	0	0	2
<i>Total</i>	<i>140</i>	<i>57</i>	<i>116</i>	<i>109</i>	<i>422</i>

Table 2. Descriptive statistics for the main constructs.

Constructs	<i>N</i>	<i>M</i>	<i>SD</i>	α	Range		Skew
					Potential	Actual	
Task significance	459	3.27	0.57	.81	1-4	1-4	-0.70
Task variety	459	3.75	1.01	.90	1-5	1-5	-0.68
Task complexity	459	3.86	1.00	.86	1-5	1-5	-0.92
Info. processing	459	3.79	0.92	.88	1-5	1-5	-0.74
Problem solving	459	3.31	0.99	.83	1-5	1-5	-0.34
Planning autonomy	459	2.96	1.09	.89	1-5	1-5	-0.01
Decision autonomy	459	3.45	1.01	.89	1-5	1-5	-0.49
Methods autonomy	459	3.34	0.96	.87	1-5	1-5	-0.33
Feedback	459	3.82	0.57	.67	1-5	2-5	-0.16
Interaction	459	3.35	0.85	.82	1-5	1-5	-0.30

Table 3. Perceived workplace learning support by age group

Constructs	M and SD by age group				Kruskal-Wallis		
	< 31 (n = 148)	31-40 (n = 62)	41-50 (n = 125)	> 50 (n = 122)	χ^2	p	η^2
Task significance	3.11 (0.54)	3.41 (0.62)	3.30 (0.57)	3.36 (0.54)	20.710**	.000	.040
Task variety	3.63 (1.06)	3.92 (0.93)	3.70 (1.06)	3.85 (0.91)	4.230	.238	.012
Task complexity	3.66 (1.02)	4.12 (0.97)	3.91 (0.97)	3.93 (0.99)	12.970**	.005	.023
Info. processing	3.71 (0.89)	3.93 (0.87)	3.80 (0.96)	3.81 (0.92)	3.116	.374	.006
Problem solving	3.20 (0.98)	3.55 (0.90)	3.25 (1.03)	3.38 (1.00)	5.927	.115	.014
Planning autonomy	2.88 (1.13)	3.04 (1.04)	2.85 (1.13)	3.14 (1.03)	6.611	.085	.013
Decision autonomy	3.25 (1.06)	3.72 (0.89)	3.35 (1.01)	3.63 (0.95)	15.859**	.001	.033
Methods autonomy	3.21 (1.03)	3.57 (0.86)	3.16 (0.95)	3.54 (0.87)	14.986**	.002	.034
Feedback	3.83 (0.56)	3.79 (0.59)	3.79 (0.59)	3.86 (0.56)	1.147	.766	.003
Interaction	3.36 (0.85)	3.30 (0.75)	3.36 (0.86)	3.36 (0.87)	.405	.939	.001

Notes. ** $p < .01$, * $p < .05$.

Table 4. Perceived workplace learning support by occupational group

Constructs	M and SD by occupational group								Kruskal-Wallis		
	1 (n=51)	2 (n=108)	3 (n=88)	4 (n=19)	5 (n=68)	7 (n=37)	8 (n=17)	9 (n=32)	χ^2	<i>p</i>	η^2
Task importance	3.70 (0.35)	3.40 (0.49)	3.33 (0.51)	3.11 (0.61)	3.11 (0.58)	3.32 (0.57)	2.95 (0.54)	2.77 (0.64)	72.323**	.000	.17
Task variety	4.34 (0.59)	4.20 (0.78)	3.80 (0.89)	3.38 (1.03)	3.49 (0.89)	3.59 (0.98)	2.68 (0.95)	2.70 (1.29)	88.612**	.000	.24
Task complexity	4.19 (0.68)	4.35 (0.71)	4.09 (0.83)	3.53 (1.05)	3.25 (1.02)	3.88 (0.85)	3.63 (1.05)	2.71 (1.22)	93.529**	.000	.25
Info. Processing	4.32 (0.61)	4.29 (0.62)	3.95 (0.75)	3.55 (0.91)	3.40 (0.85)	3.41 (0.93)	2.99 (0.83)	2.61 (1)	125.434**	.000	.32
Problem solving	3.73 (0.7)	3.94 (0.63)	3.21 (0.91)	3.04 (0.98)	3.06 (0.94)	3.20 (0.98)	2.76 (1.11)	1.97 (0.85)	111.821**	.000	.29
Planning autonomy	3.57 (0.99)	3.13 (0.87)	3.05 (1.04)	3.18 (1.41)	2.57 (0.96)	2.69 (1.09)	1.88 (1.04)	2.23 (1.13)	63.482**	.000	.15
Decision autonomy	4.27 (0.7)	3.92 (0.66)	3.35 (0.9)	3.02 (1.23)	3.14 (0.91)	3.3 (0.89)	2.18 (0.99)	2.4 (1.01)	122.103**	.000	.31
Methods autonomy	3.95 (0.72)	3.81 (0.76)	3.17 (0.85)	3.02 (0.95)	3.12 (0.96)	3.14 (0.88)	2.41 (0.89)	2.41 (1.02)	93.170**	.000	.24
Feedback	3.96 (0.62)	3.74 (0.58)	3.83 (0.55)	3.69 (0.53)	3.88 (0.52)	4.02 (0.52)	3.67 (0.37)	3.75 (0.67)	15.550*	.030	.03
Interaction	3.6 (0.71)	3.53 (0.78)	3.44 (0.82)	3.44 (0.78)	3.23 (0.81)	3.18 (0.87)	2.91 (1.05)	2.59 (0.88)	35.737**	.000	.10

Notes. 1 = Managers; 2 = Professional; 3 = Technicians and associate professionals; 4 = Clerical support workers; 5 = Service and sales workers; 7 = Craft and related trades workers; 8 = Plant and machine operators, and assemblers; 9 = Elementary occupations. ** $p < .01$, * $p < .05$.