Article

Keeping up Performance in Times of Crisis—Work Context, Supervisor Support, and Their Relation to Learning Demands and Performance

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Abstract

Various job demands and resources influence employee performance. This study examined employees' perceptions of factors that facilitated or hindered their work performance during a time of crisis—specifically, the COVID-19 pandemic—with a focus on sudden learning demands and supervisor support. A mixed-methods approach was employed, drawing on both quantitative and qualitative data from two studies in the education sector. Study 1 analysed open-ended survey responses using data-driven content analysis (N = 851). The most prevalent themes associated with disrupted workflow and reduced performance included work overload, large group sizes, time pressure, and insufficient resources. A comparison between respondents who appraised learning demands as a hindrance and those who viewed them as a challenge revealed only minor differences. Notably, many identified issues were linked to supervisory practices, prompting a deeper investigation in Study 2. Study 2, a cross-sectional mediation analysis (N = 1242), demonstrated that supervisor support directly and indirectly improved performance by reducing the strain caused by learning demands. Key themes from open-ended responses highlighted the importance of information-sharing, effective communication, and personal contact. The findings suggest that by prioritising clear communication, trust-building, and tangible support, organisations can strengthen supervisor support and, in turn, enhance employee performance during times of crisis.

Keywords: crisis; COVID-19; learning demands; supervisor support; work performance
JEL: J24; J81; M12; M53

1. Introduction

One crucial antecedent for an organization's success is its employees' ability to maintain their performance even under challenging times. Crises are sudden and unexpected events, such as the COVID-19 pandemic, that threaten the prevailing situation and cause employees uncertainty and stress (Charoensukmongkol and Phungsoonthorn, 2020). Sudden changes in the work context and an increased need to learn new skills are inevitable when a crisis arises (Afshari et al, 2022; Scheel et al, 2023), and may increase the risk of impaired performance. One field of working life hit hard by the COVID-19 pandemic was the education sector. Schools were mostly closed, and teaching was moved from the traditional face-to-face setting to an online environment with very little planning or previous experience and no time to prepare (Trinidad, 2021). Therefore, as the education sector offers a representative example of the factors that underlie workflow and performance during a crisis, it was chosen as the context of this study.

Some studies have shed light on the kind of work contexts in which employee performance has improved in the era during and after the COVID-19 pandemic (D'Souza et al, 2023; Dhoopar et al, 2022) but we still need to better understand how to support performance during crises. In general, research shows that several features of the work context are beneficial for performance—for instance, flexible job design, team composition and information-sharing complemented by supportive leadership (Jiang et al, 2012). Studies conducted in the context of the COVID-19 pandemic have reported a positive correlation between organizational resilience (Dhoopar et al, 2022) and transformative and transactional leadership (D'Souza et al, 2023) with respect to employee performance.

Change causes pressure to learn, and new skills and knowledge are especially needed in a crisis. New and sudden learning requirements are job demands that can be experienced as either engaging or strenuous (Bakker and Demerouti, 2007, 2017; Cavanaugh et al, 2000; Korunka et al, 2015; Smith et al, 2022). Employees' positive appraisal of new and sudden learning requirements seems to be related to better well-being and performance (Cavanaugh et al, 2000; Korunka et al, 2015; Smith et al, 2022). Moreover, personal appraisals can also be linked to personal experiences of the work context. However, no previous studies have determined whether the appraisal of sudden learning demands affects what kind of work context is needed in order to keep up performance, and our research contributes to filling this gap.

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We conducted two separate studies to gain new insights into the work contexts that impair or support performance during times of crisis. We studied whether employees' appraisal of new and sudden learning demands, their experiences of the work context, and supervisor support are related. The focus of Study 1 was on the work context factors that employees considered essential for their performance (good flow of work) in times of crisis and whether these issues differed among employees who appraised the new and sudden learning requirements as engaging and those who considered them strenuous. The findings of Study 1 emphasize the importance of supervisory support and its relation to strain caused by new learning demands and to performance, which was the focus of Study 2. Our theoretical framework relies on job demands and resources theory (JD-R theory) (Bakker and Demerouti, 2007, 2017) and the Challenge-Hindrance Stress Model (CHM) (Horan et al, 2020; Mazzola and Disselhorst, 2019).

2. Literature Review

2.1 Work Context, Supervisory Work, and Performance

JD-R theory states that every job has its own demands and resources that influence organizational outcomes, including employee performance (Bakker and Demerouti, 2007, 2017). Extensive research literature has shown that too many job demands, that is, features of the job and work environment that need effort, lead to negative outcomes. Job resources on the other hand are features of the job and work environment that help the achievement of goals and lead to positive outcomes. Supervisor support has been recognized as an essential job resource, and earlier literature on crisis management has also shown its significance during times of crisis.

However, it is less clear which other job resources and demands are relevant to employee performance during exceptional times. Nevertheless, recent studies of job demands have shown that individuals can appraise their job characteristics differently, and perceive them as either hindering or challenging, depending on the specific work context and the individual (Bakker and Demerouti, 2017; Mazzola and Disselhorst, 2019; Schaufeli and Taris, 2014). The CHM (Horan et al, 2020; Mazzola and Disselhorst, 2019) and some empirical studies propose that demands perceived as negative hindrances impair an individual's job performance, while those seen as positive challenges can be motivating and invigorating, resulting in positive emotions and outcomes (Cavanaugh et al, 2000; Horan et al, 2020; Van Laethem et al, 2019; Lepine et al, 2005; Pearsall et al, 2009; Staufenbiel and König, 2010).

As employees' appraisals of their job demands as either hindering or challenging are decisive in terms of the outcome (Lazarus and Folkman, 1984; Li et al, 2020; Van den Broeck et al, 2010), studying what kind of work context, in other words, job demands and resources, employees perceived as promoting or disturbing their performance during the world-wide COVID-19 crisis, is essential. Specif-

ically, during a crisis, sudden and unexpected changes require quickly learning and adapting to new practices and ways of working. Thus, learning became an inevitable job characteristic during the crisis caused by the COVID-19 pandemic. However, existing research offers a conflicting perspective on whether workplace learning is a favourable challenge or a detrimental hindrance demand in general (Bakker and Demerouti, 2007, 2017; Cavanaugh et al, 2000; Korunka et al, 2015; Smith et al, 2022) and during crises. Moreover, it is unclear how the perceptions of the learning requirements relate to supervisor work, and what kinds of job resources were gained by or needed from a supervisor during the crisis.

As appraisals are subjective and linked to individuals' attitudes, in this study we consider them employees' personal resources (J-DR theory). The way in which employees respond to a job demand are important and positive appraisals, for instance, have shown to be related to better work well-being, whereas negative appraisals can lead to job dissatisfaction and turnover intentions (see, e.g., Li et al, 2020; for a meta-analysis see Mazzola and Disselhorst, 2019). Moreover, personal resources, such as employees' skills and attitudes, also play an important role in the link between job demands and resources, and organizational outcomes. JD-R theory and empirical evidence (Grover et al, 2018) suggest that the relationship between personal resources and job demands is reciprocal, and our research explored both perspectives. Our study thus sheds some light on the understudied issue of the relationships between job demands and personal resources (Schaufeli and Taris, 2014), which are reflected in employees' appraisals of job characteristics as negative demands or positive resources.

2.2 Work Context and Job Performance

Work contexts contain various resources as well as hindrance and challenge demands that influence organizational outcomes, including improved or impaired employee performance (Bakker and Demerouti, 2007, 2017). Hindrance demands have a well-established negative impact on job performance (Lepine et al, 2005; Mazzola and Disselhorst, 2019). For example, higher job demands such as workload, emotional demands, and work-home conflict have shown to predict increased exhaustion component of burnout, subsequently leading to lower in-role performance (Bakker et al, 2004). Gilboa et al (2008)'s meta-analysis also revealed various work demand hindrances that impair job performance. These were related to work roles such as role ambiguity, role conflict, and role overload; job insecurity and environmental uncertainty; and work-family conflict and situational constraints (Gilboa et al, 2008).

Previous studies have also shown that information overload and techno-stress adversely affect productivity at work (Karr-Wisniewski and Lu, 2010; Tarafdar et al, 2010). During the COVID-19 crisis, many of these potentially harmful job demands arose. The rapid transformations in

our work environments, coupled with the heightened demands for continuous learning and the intensification of work (Korunka et al, 2015; Rantanen et al, 2021) were pronounced during COVID-19 (Afshari et al, 2022; Scheel et al, 2023). Throughout the pandemic, the abrupt surge in remote work and the permanent home office seemed to be a job demand that risked employee well-being (Scheel et al, 2023). Remote work also triggered a heightened reliance on information and communication technologies, information overload, and constant demands for availability. Therefore, the burden of techno-stress (La Torre et al, 2019) may have been a particularly prominent job demand during the crisis. The empirical evidence on teleworking during COVID-19 also suggests that techno-stressors reflect work-home conflicts and work overload, and that the related strain was associated with impaired perceived performance (Camacho and Barrios, 2022).

Job resources such as autonomy, opportunities for professional development, and social support facilitate work engagement and can positively affect performance (Bakker et al, 2004, 2007; Demerouti and Cropanzano, 2010). During the pandemic, the shift to remote work significantly reduced face-to-face social interactions at the workplace, and thus deteriorated job resources. Qualitative research on the personal and job resources of academics during crises has indicated that job resources that proved essential during the COVID-19 were online communication options, appropriate working conditions, organizational-social support, and individual factors, whereas the risks arose from the lack of face-to-face interaction and management actions (Karatuna et al, 2022). A study of Australian school teachers has also suggested that relatedness between students and teachers are important resources associated with subjective vitality and a decreased level of turnover intentions during COVID-19 (Collie, 2022).

These are critical findings, because the JD-R model considers social support, from both colleagues and supervisors, a key resource (Bakker and Demerouti, 2017). In addition to direct support, supervisors may also indirectly influence employee performance by the various impacts they have on their employees' work environment (Bakker and Demerouti, 2017). Nevertheless, to the best of our knowledge, relatively little research has focused on the role of social support as a resource in times of crisis, and existing studies have mainly focused on its relations with well-being (e.g., Usman et al, 2021). There is a need to study which demands and resources are critical to performance and, specifically, the characteristics of social support and resources that supervisors can provide.

2.3 How Can a Supervisor Enhance Performance?

The way in which supervisors lead their subordinates is an essential job resource in terms of their performance (Afzal et al, 2019; Legood et al, 2021). Earlier research on leadership and performance has indicated that contemporary leadership styles, for example, servant and ethical

leadership (for a meta-analysis, see Legood et al, 2021) and coaching leadership (Peláez Zuberbühler et al, 2023; Tanskanen et al, 2019) are greater predictors of employees' performance than many others, such as transformational leadership (Legood et al, 2021). In addition, a relational approach to supervisor-subordinate dyads, Leader-Member Exchange (LMX) relationships in particular (Le Blanc and González-Romá, 2012; Tanskanen et al, 2019), has also been studied, and the quality of these relationships have shown to predict how employees perform. It has also been argued that supervisor support is an important job resource (Bakker and Demerouti, 2007) although it has not often been studied as an antecedent of employee performance (Nielsen et al, 2017). Overall, previous literature has identified the role of personal attention and supportive supervisor behaviour with good intentions as critical for promoting subordinates' performance.

However, a crisis is an unexpected situation in which the supervisor has no time for preparation or of which the supervisor has no previous experience (Wu et al, 2021). Leading people effectively in times of crisis has been found to be more complicated than in stable conditions (Dasborough and Scandura, 2022; Stoker et al, 2022). For instance, during the COVID-19 pandemic, leadership took place either totally or partly via ICT-mediated platforms (Newman and Ford, 2021), also in organizations with little or no earlier experience of these platforms. In a crisis situation, leaders are expected to show empathy and compassion for their followers (Dasborough and Scandura, 2022). They are also expected to take a directive role, to plan and organize, and in collaboration with their subordinates, to develop adaptive and creative solutions to enable good performance in the new situation (Riggio and Newstead, 2022; Wu et al, 2021). Thus, it seems that what is considered effective leadership for employee performance may be different during crises as compared to a more stable context, and in this research, we explored the features of good supervisory work during the crisis.

2.4 Appraisal of Learning Demands in a Change Situation—A Personal Resource

During COVID-19, many new job demands arose, as the crisis resulted in sudden, novel changes that required fast adaptation, and these demands were often experienced as hindrance demands (Scheel et al, 2023). Despite the various potential stressors that crises may bring, recent research on work-related stress highlights a key insight: the same job characteristics can be appraised either negatively or positively depending on the specific work context and the individual (Bakker and Demerouti, 2017; Mazzola and Disselhorst, 2019; Schaufeli and Taris, 2014), and it is important to examine how individual employees themselves appraise their job demands (Horan et al, 2020; Li et al, 2020, 2021; O'Brien and Beehr, 2019; Webster et al, 2010). Employees' appraisals of their job demands can be seen as reflections of not only the work context, but also of their skills and abili-
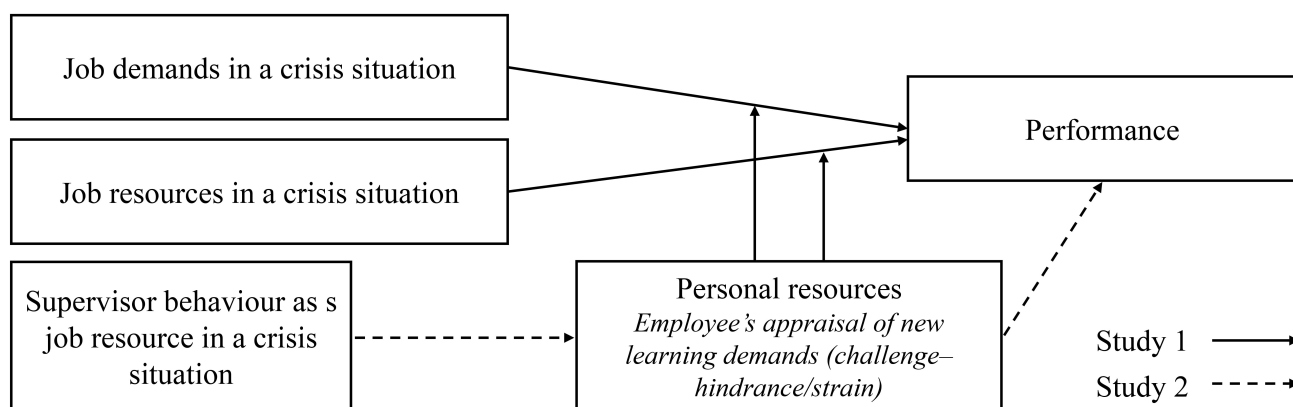
Fig. 1. The main concepts examined in this study.

ties and their sense of being able to have an impact on their work environment. Thus, they are also a personal resource, as in JD-R theory (Xanthopoulou et al, 2007, pp. 123–124).

Previous research presents a mixed view of whether workplace learning serves as a positive challenge or a negative hindrance demand. On the one hand, learning is recognized as a cognitive job demand that necessitates sustained mental effort and can result in considerable exertion, often leading to associated physiological and cognitive costs (Bakker and Demerouti, 2007, 2017). Consequently, heightened learning demands during crises can yield adverse outcomes, such as reduced performance and wellbeing. On the other hand, tasks demanding intense cognitive effort, including learning, as well as factors such as time pressure and workload, can also be appraised as positive challenges that lead to favourable outcomes (Cavanaugh et al, 2000; Korunka et al, 2015; Smith et al, 2022). Hence, even during crises, it is plausible that learning can be perceived as a positive challenge that enhances performance. As learning is a prominent job characteristic during a crisis, it is also important to study whether negative and positive appraisals of learning demands are related to the way in which employees perceive their work context. Do the other job demands and resources that underlie good workflow and performance differ among those who experience learning as a negative hindrance and those who experience them as a positive challenge?

Moreover, both JD-R theory and empirical evidence (Grover et al, 2018) show that personal resources can also be affected by job resources (Schaufeli and Taris, 2014; Xanthopoulou et al, 2007). As stated above, leaders' behaviour is an essential job resource, especially during a crisis (Charoensukmongkol and Phungsoonthorn, 2020). For instance, supervisor support (Charoensukmongkol and Phungsoonthorn, 2020) or trust between supervisor and subordinate (Skiba and Wildman, 2019) have been found to diminish work-related uncertainty, and did so also during the COVID-19 pandemic (Charoensukmongkol and Phungsoonthorn, 2020). A relevant issue in the context of crises is whether supervisor support affects employees' appraisals

of their job demands, for instance, if intensified learning demands are perceived positively or negatively. Nevertheless, it is unclear, how learning demands were appraised during the COVID-19 crisis. One main question of our research was whether supervisor support, as a contextual factor, determined whether the intensified learning demands acted as a positive challenge and a personal job resource that enabled good performance in the midst of unexpected changes.

In sum, our study offers several contributions. Study 1 provides new knowledge on how employees perceive their work contexts and which job demands and job resources they consider relevant to their performance and workflow during crises. We also analysed whether employees' appraisal of learning was linked to how they perceived job demands and resources. Study 2 examined supervisor support as an essential job resource, and whether supervisor support is linked to the positive or negative appraisal of learning requirements, and directly or indirectly to performance. Its results will also contribute to understanding the elements of supervisory work and the kind of resources employees want from their supervisor during a crisis. Fig. 1 shows the main concepts examined in this study.

3. Study 1

3.1 Study 1: Methods

We adopted a mixed-method research design. Study 1 utilized qualitative data collected from 851 teachers working in comprehensive schools (26%), upper secondary vocational schools (57%), and universities of applied sciences (18%) in Finland. The majority of respondents were women (71%) and their mean age was 50.7 (SD = 9.0). The questionnaire data consisted of various items related to the cognitive demands of work. In this study, we used open-ended responses to the question "What are the main hindrances to the smooth flow of work at the moment?" (n = 1047) and the open-ended responses to the question "What solutions could be used to improve the flow of work at the moment?" (n = 933). We also used data on the self-reported frequency of learning demands at work and the perceived level of strain and/or engagement associated with these de-
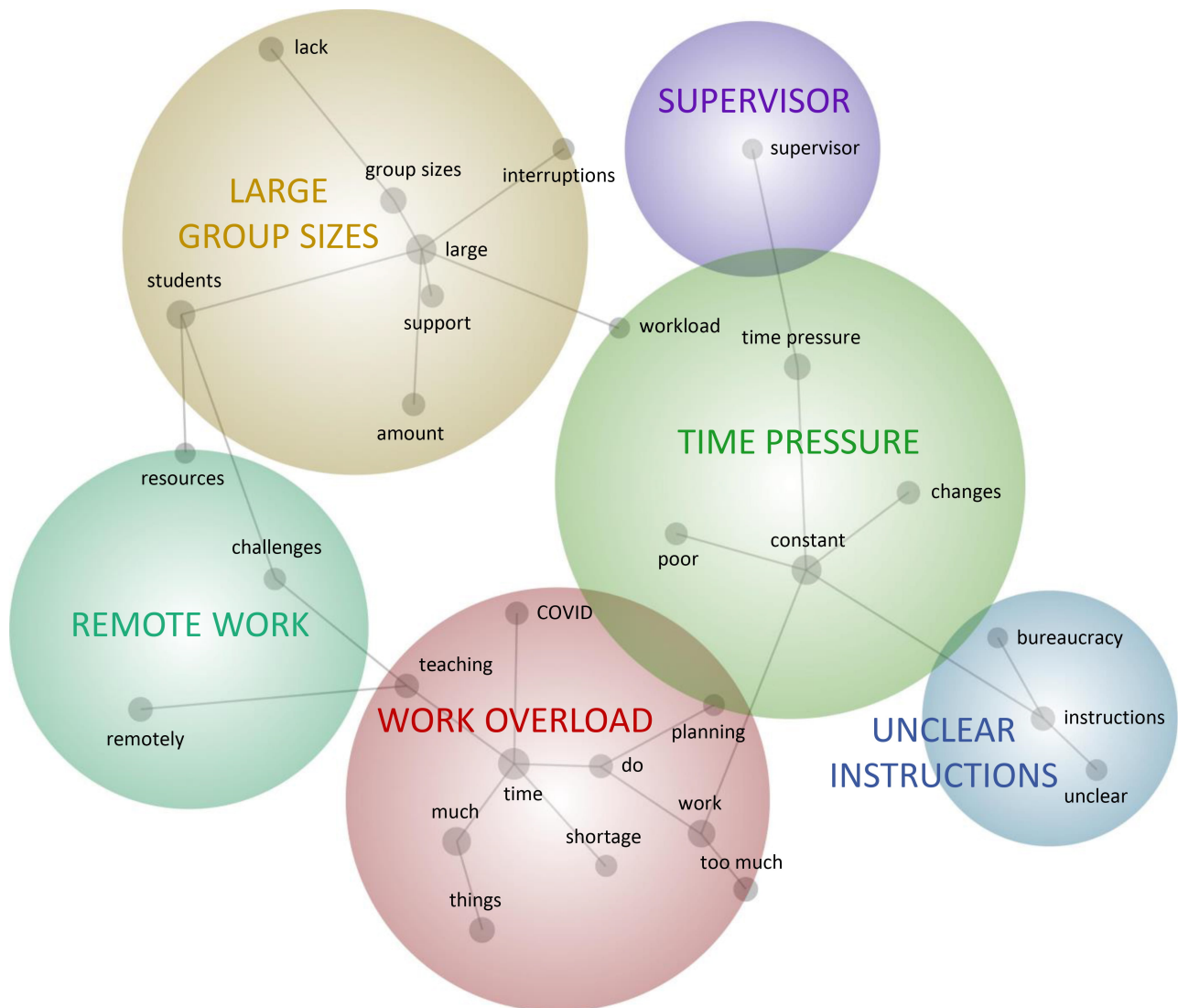
Fig. 2. Leximancer concept map of hindrances to work performance.

mands. The respondents were categorized into two groups on the basis of their responses: those who appraised learning demands as engaging (60%) and those who appraised learning demands as strenuous (40%). The data were collected at four different timepoints: spring 2020 (21%), autumn 2020 (26%), beginning of 2021 (49%) and spring 2022 (4%). Some of the respondents provided responses at multiple timepoints. All the items and responses were originally in Finnish.

The open-ended questionnaire responses were analysed using a semi-automated content analysis performed with Leximancer (version 4.5, Leximancer Pty Ltd., Australia), a text mining software tool that utilizes machine learning to identify the main concepts and their relations in textual data. This approach also enabled us to investigate potential differences between the groups of employees who appraised learning as a hindrance or as a challenge. Additionally, the qualitative exploratory approach enabled us to identify new themes that are relevant to performance

during times of crises and under the high requirements for workplace learning. The methodology we employed for the Leximancer analysis is described in more detail in the Appendix, and a more comprehensive description of the underlying principles of Leximancer can be found in Smith and Humphreys (2006).

The results of the Leximancer analysis are illustrated as a concept map that shows the concepts that were identified in the responses in terms of prevalence and interconnectedness. On the map, each concept is represented by a grey dot, the size of which signifies its connectivity to all the other concepts. The spanning tree of grey lines represents the strongest connections between the concepts. Concepts that frequently appeared together in the text are clustered into themes, indicated by large circles. The theme circles are heat-mapped so that the colour represents the importance of the theme. The most relevant themes are denoted by hot colours (red, orange) and the least relevant themes with cool colours (blue, purple).

Table 1. Themes and associated number of hits in leximancer analysis of hindrances to work performance, and representative quotations.

Theme	Hits	Representative quotations
Work overload	419	"There's too much work, and too many things come with tight deadlines. When there's teaching or project deadlines, I can't do anything else, and so other prioritizable tasks are left to evenings because they are supposedly so urgent." "The workload is heavy. Work methods often change due to the prevailing COVID situation, making the planning of work more challenging."
Large group sizes	303	"Large group sizes, meaning the ratio of adults to the number of pupils. The high number of pupils needing support and pupils' psychological symptoms." "Peace to work, work is constantly interrupted. The main reason is challenging pupils who don't get the support they need."
Time pressure	227	"A heavy workload, hurry, the feeling of always getting behind with work, work piling up." "Constant changes, changing instructions, countless forms, time pressure, compulsory need to be efficient and quick."
Remote work	111	"Remote work, difficulty handling matters, not seeing each other, problems accumulate when they can't be discussed. Calendar full of virtual meetings, no breaks, now every little thing has to be a Teams meeting." "There are many new tools and programs that we could use, but there is hardly any time to learn and master them. Interaction has diminished in remote work, which has, in part, compromised teaching and the ability to respond to potential student needs."
Unclear instructions	62	"Insufficient, unclear instructions, as well as continual changes in practices. A massive increase in bureaucracy that consumes time and energy from actual work." "Restrictions caused by COVID, supervisor's unclear, rigid instructions and orders."
Supervisor	17	"A poor supervisor who can't manage schedules. Everything gets done at the last minute, late, or not at all." "The idea that leadership and supervisory work is primarily about managing individual employees' working hours rather than enabling effective self-directed teamwork."

3.2 Study 1: Results

In the Leximancer analysis concerning hindrances to work performance (flow of work) 29 concepts were identified. The results revealed a variety of factors and conditions that hinder work performance and were repeatedly mentioned in the responses. The concept map in Fig. 2 illustrates the concepts as well as the higher level "themes" into which frequently co-occurring concepts were clustered. The proximity of the concepts on the map indicates how often they appeared together in the text. For example, 39% of all the text segments that contained the concept of "instructions", also contained the concept of "unclear"—thus these two concepts are located close to each other on the map.

The themes were named after careful consideration of the occurrence and co-occurrence information of the concepts grouped into each one. Most themes were named after the most connected concept within its circle. Table 1 provides the same information in a more detailed form, presenting the number of hits for each theme (i.e., relevance, total number of text segments associated with that theme), and representative quotations from respondents.

The most relevant and closely interconnected themes discussed in the responses were Work overload, Large group sizes and Time pressure, and these formed the core of the entire set of responses. The interconnected nature of these themes is also apparent in the respondent quota-

tions presented in Table 1. These quotations depict day-to-day work characterized by heavy workloads, tight schedules and time pressure, interruptions, and other challenges that accumulate among large groups of students, many of whom require special support, as well as constantly changing work practices and instructions.

Closely located to the Work overload theme was the medium-sized theme of Remote work. This theme encompassed descriptions of the workload associated with learning new remote work tools as well as the accumulation of problems stemming from reduced communication during remote work. Finally, the smaller themes of Unclear Instructions and Supervisor were located close to the central theme of Time Pressure. The related responses included descriptions of unclear and frequently changing instructions, and problems concerning supervisory work.

In the Leximancer analysis, which focused on solutions to enhance work performance (flow of work), a similar analytical process was conducted to that previously described in relation to hindrances to work performance. The analysis identified 19 concepts. The results revealed a range of potential solutions that were frequently cited within the responses. The concept map depicted in Fig. 3 illustrates these concepts and themes, and their interconnections.

Table 2 shows the number of hits for each theme and the representative quotations from respondents. The most relevant and closely interconnected themes discussed in the
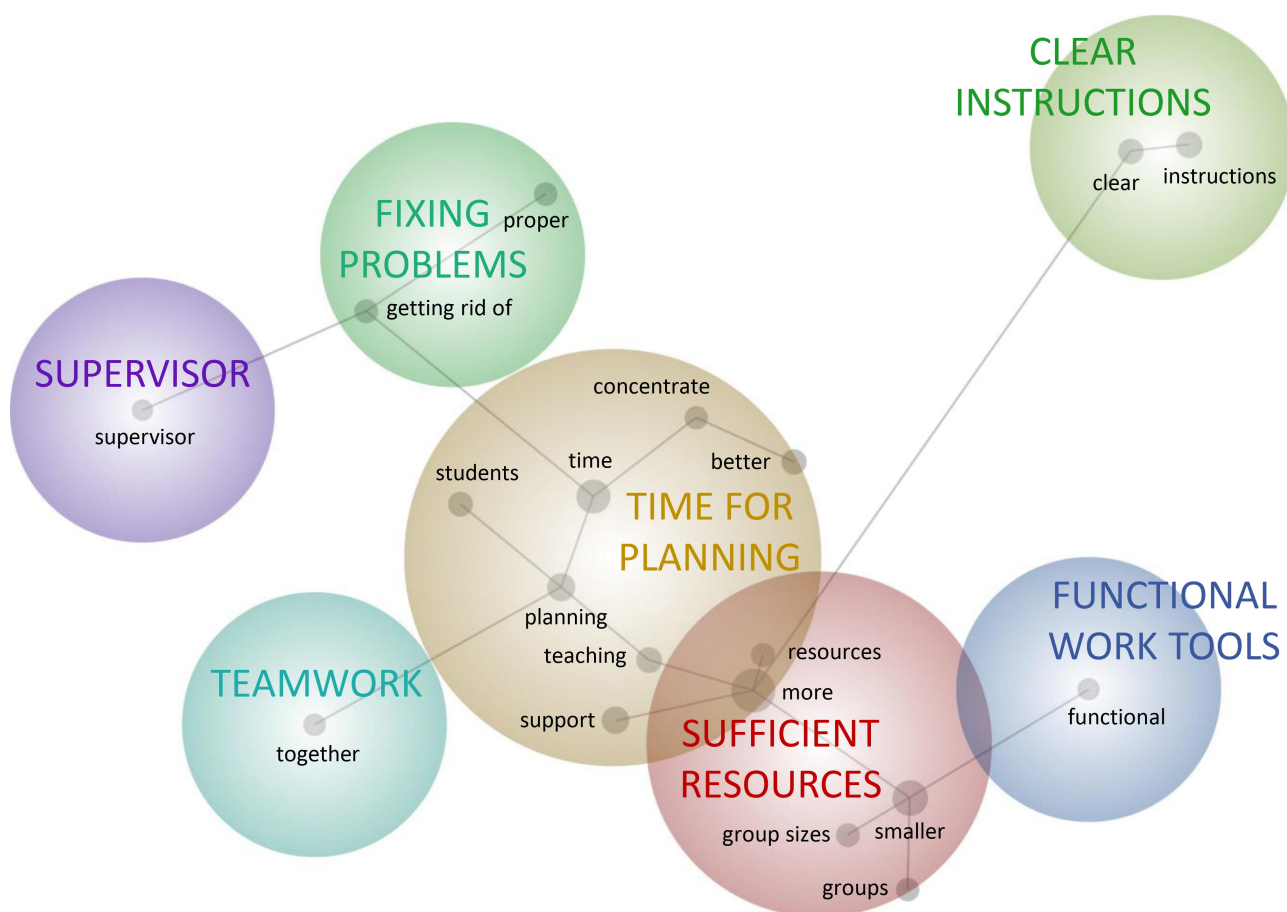
Fig. 3. Leximancer concept map of proposed solutions to enhance work performance.

responses were Sufficient resources and Time for planning, which also constituted the central content of the responses. The solutions proposed in the related responses included reducing group sizes, increasing the number of classroom teachers, special education teachers and support staff, and allocating more time for work tasks, particularly for both individual and collaborative planning.

Closely located to the Time for planning theme were the smaller themes of Fixing problems and Teamwork. The former encompassed responses suggesting that work performance could be enhanced by solving various problems relating to, for instance, instructions, workspaces, and work processes. The latter, in turn, included proposals of solutions for working more collaboratively and sharing responsibilities.

On the top right of the concept map was the medium-sized Clear Instructions theme, which included mentions of clear instructions, work practices and rules. Finally, the smaller Functional work tools and Supervisor themes encompassed responses relating to effective tools and workspaces, as well as good quality supervisory work.

After the two sets of responses had been analysed as a whole, the concepts contained in the responses of the groups perceiving learning demands as engaging or strenuous were contrasted against each other. The analyses indicated that all 29 (hindrances) and 19 (solutions) concepts were present in the responses of both groups, and showed a significant overlap in the most frequently mentioned concepts in the two groups. However, the analyses also revealed differences between the relative prevalence of some of the concepts in the groups.

With regard to hindrances to the flow of work, certain concepts such as resources, group sizes, workload, constant, time pressure, changes, and teaching were highlighted in the responses of the employees who perceived learning demands as strenuous. Conversely, concepts such as instructions, bureaucracy, planning, remote work, and problems were more prominent in the responses of the employees who perceived learning demands as engaging.

Regarding the solutions proposed by the respondents to improve the flow of work, concepts such as supervisor, together, getting rid of, teaching, and functional were highlighted in the responses of those who perceived learning demands as strenuous. On the other hand, concepts such as clear, instructions, planning, resources, and groups were more prominent in the responses of those who perceived learning demands as engaging.

Table 2. Themes and associated number of hits in leximancer analysis of the proposed solutions to enhance work performance, and representative quotations.

Theme	Hits	Representative quotations
Sufficient resources	236	"Smaller groups, good facilities, a lot more resources." "We need to establish more special needs classes, that is, more special education teachers, more teachers, smaller class sizes, more assistants in classrooms, and other staff members to monitor breaks, rather than teachers or assistants."
Time for planning	235	"The working weeks are planned so that teaching isn't constantly 30 hours a week. That way, we could focus on better planning our own work and could plan different ways to teach effectively." "Planning pupils' groups so that the weaker students get the support they need, and fast learners get enough challenges. Collaborative teaching: teachers from the same grade level teaching and planning together for the same grade level education."
Clear instructions	65	"Clear rules and instructions, as well as roles and practices." "Good flow of information and clear instructions. Adhering to instructions and practices."
Fixing problems	47	"Getting work planning in order, rationalizing processes, proper facilities, break rooms, and proper tools." "Instructions in one place, easily and logically accessible. Sorting out support service processes so that it's clear to everyone who's responsible and who to turn to."
Teamwork	15	"Collaboration, sharing responsibilities/tasks." "Joint planning meetings held by the supervisor, where things can be collectively discussed, would also be important, but currently, there are hardly any."
Functional work tools	14	"Work facilities and equipment that work." "Creating viable plans and sticking to agreed-upon matters."
Supervisor	9	"By being systematic, the supervisor could distribute the work more evenly, and by more effective provision of information." "If the supervisor appreciated us even a little, supported us, and showed an interest, listened, etc. We have to work in our free time-getting rid of that."

3.3 Study 1: Discussion

The findings of Study 1 shed light on the significant challenges faced by employees in maintaining work performance in the education context during COVID-19. The results provide new empirical evidence that job demands and personal resources, as reflected in workers' experiences of workflow and attitudes toward learning demands, are closely interconnected and jointly influence their work performance (Grover et al, 2018; Schaufeli and Taris, 2014). The identified themes of work overload, large group sizes, and time pressure are interrelated issues that depict a work environment characterized by heavy workloads, demanding schedules, and time constraints, exacerbated by the presence of large student groups, many of whom require special attention and support. The results thus suggest that hindrance demands during crises are very similar to those recognized in previous JD-R research, i.e., workload, time pressure, and work intensification (Afshari et al, 2022; Bakker et al, 2004; Gilboa et al, 2008; Scheel et al, 2023). Moreover, our study also supports the view that during the COVID-19 crisis, remote work demands, new in the field of education, were also evident (Collie, 2022; Karatuna et al, 2022), and indicated that the job demand of large student groups, which is specific to the field of education, was strenuous.

The theme of unclear instructions also emphasizes the importance of effective communication and support structures for promoting work performance during times of crisis. These results are in line with previous findings that a lack of face-to face social interactions and communication problems were negative hindrances during COVID-19 (Collie, 2022; Karatuna et al, 2022).

In summary, in times of crisis, it is essential to focus on resources and positive challenges related to social support, communication and management, as these can enhance performance. The results were not clear regarding the differences between the group that appraised learning as a hindrance, and the group that appraised it as a positive challenge. Nevertheless, the differences in the open-ended responses suggest that hindrances related to workload and time pressure may be experienced more prominent if learning at work is strenuous, and supervisors are expected to provide resources that support performance. In contrast, those who perceived learning as a positive challenge, may have emphasized such hindrance demands as problems related to instructions and remote work, and seen that improving these conditions would support performance. However, both groups presented the same hindrances and solutions to work performance and whether there are meaningful differences between the two groups requires more research.

Even if the supervisor concept was not among the most frequent, it is notable that many of the concepts identified in Study 1 were related to the supervisor or to factors that supervisors can control and manage. These are also the fac-

Table 3. Means, standard deviations, and zero-order correlations.

Variable	Mean	SD	(1)	(2)	(3)	(4)
(1) Age	47.70	9.50	1			
(2) Gender	0.81	0.39	–0.06	1		
(3) Supervisor support	3.82	0.97	–0.08**	–0.05	1	
(4) Strain caused by learning demands	3.51	1.09	0.06*	0.08**	–0.17***	1
(5) Performance	4.58	0.53	–0.02	0.11***	0.15***	–0.19***

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. SD, Standard Deviation.

tors that previous studies before and during the COVID-19 pandemic have identified as essential resources that support performance. Therefore, Study 2 focuses in more detail on supervisor support, strain caused by new learning demands, and performance.

4. Study 2

4.1 Study 2, Part A: Sample, Methods, and Measures

The data for this study was collected during spring 2020 via an online questionnaire. The total data consists of 1242 respondents who worked as teachers at the comprehensive, secondary or university level. The majority of the respondents were women (81%) with a mean age of 47.7 and an SD of 9.5 years. The amount of missing data was small (0.8%) and was assumed to occur at random.

The results of qualitative Study 1 made us interested in whether supervisor support can improve the performance of the employees through reducing the strain caused by learning demands. To test this theorized model, we used structural equation modeling (SEM) with a robust maximum likelihood estimator (MLR) to conduct a cross-sectional mediation analysis to investigate the assumed mechanism between supervisor support, strain caused by learning demands and performance. A full-information maximum likelihood (FIML) algorithm was used to handle the missing data. In the cross-sectional mediation models, we controlled for the effects of gender and age. Supervisor support and in-role performance were modelled as latent variables, and other measures as observed variables. Descriptive analysis was performed using R (version 4.3.1; R Core Team, 2023), and the cross-sectional structural equation model was tested using Mplus (version 8.6; Muthén and Muthén, 1998–2017).

Strain caused by learning demands was measured using one question "How strenuous are the new competence demands of the job?". Participants responded to this question using a five-point scale ranging from 1 (Not strenuous at all) to 5 (Extremely strenuous). Supervisor support was measured using a three-item scale from the QPS-Nordic questionnaire (Wännström et al, 2009). The standardized factor loadings for the three-item scale were high, ranging from 0.79 to 0.90. Cronbach's alfa for the scale was 0.89, and McDonald's omega was 0.90. Both of these reliability measures indicated high reliability for supervisor support.

Performance was measured using a six-item scale adapted from a scale developed by Williams and Ander-son (1991). One residual covariance was allowed between items 1 and 2, as "adequately completes assigned duties" and "fulfils responsibilities specified in the job description" might in practice consist of very similar tasks. CFA fit indices ($\chi^2 = 33.12$, df = 8, $p < 0.001$, RMSEA = 0.050, CFI = 0.986, TLI = 0.974, SRMR = 0.022) indicated a good fit between the data and the six-item solution and the one that allowed residual covariance. The standardized factor loadings for the six-item performance scale were acceptable, ranging from 0.52 to 0.92. Cronbach's alfa for the scale was 0.89, and McDonald's omega was 0.95. Both these reliability measures indicated high reliability for performance.

4.2 Study 2, Part A: Results

Descriptive analysis (see Table 3) of the study variables indicated that the overall level of supervisor support (mean = 3.82) and performance (mean = 4.58) was high. The overall level of strain caused by learning demands also weighed towards higher values (mean = 3.51). As can be seen in Table 3, correlations between the study variables indicated associations between supervisor support, strain caused by learning demands, and performance. Supervisor support positively correlated with performance (r = 0.15, $p < 0.001$) and negatively correlated with strain caused by learning demands (r = –0.17, $p < 0.001$). In addition, strain caused by learning demands negatively correlated with performance (r = –0.19, $p < 0.001$). Therefore, descriptive correlations also supported our assumption that strain caused by learning demands could mediate the effect of supervisor support on performance.

The theorized mediation model fitted well with the data ($\chi^2 = 140.02$, df = 46, $p < 0.001$, RMSEA = 0.041, CFI = 0.981, TLI = 0.973, SRMR = 0.026). Table 4 shows the standardized regression coefficients of the tested mediation model. The associations between supervisor support, strain caused by learning demands, and performance were similar to the descriptive correlations. Supervisor support was negatively related to cognitive strain ($\beta = –0.17$, $p < 0.001$), suggesting that an increase in supervisor support corresponds to a decrease in strain caused by learning demands. Supervisor support was also positively related to performance ($\beta = 0.12$, $p < 0.001$), indicating that an increase in supervisor support corresponds to an increase in performance. Additionally, strain caused by learning demands was negatively associated with performance ($\beta = –0.19$, $p < 0.001$), suggesting that an increase in strain

Table 4. Structural standardized regression coefficients (β), standard errors (SE) and 95% confidence intervals (CI).

Predictor	Outcome: Supervisor support			Outcome: Cognitive strain			Outcome: Performance		
	β	SE	95% CI	β	SE	95% CI	β	SE	95% CI
Age	−0.09**	0.03	(−0.14, −0.03)	0.05	0.03	(0.00, 0.11)	−0.01	0.03	(−0.06, 0.05)
Gender[a]	−0.06	0.03	(−0.11, 0.00)	0.08**	0.03	(0.02, 0.14)	0.10**	0.03	(0.04, 0.16)
Supervisor support	−	−	−	−0.17***	0.03	(−0.23, −0.11)	0.12***	0.03	(0.05, 0.18)
Strain caused by learning demands	−	−	−	−	−	−	−0.19***	0.03	(−0.25, −0.14)

Note. [a] 0 = man, 1 = woman. ** $p < 0.01$, *** $p < 0.001$.

Table 5. Standardized Total, Direct, and Indirect Effects of Supervisor Support on Performance.

Effect	β	SE	95% CI
Total	0.15***	0.03	(0.09, 0.21)
Direct	0.12***	0.03	(0.05, 0.18)
Indirect	0.03***	0.01	(0.02, 0.05)

Note. *** $p < 0.001$.

caused by learning demands corresponds to a decrease in performance.

Table 5 shows the results of the tests for the total, direct and indirect effect. The total effect of supervisor support on performance was positive and significant ($\beta = 0.15$, $p < 0.001$), as was the direct effect ($\beta = 0.12$, $p < 0.001$). A significant direct effect suggests that there were other pathways than strain through which supervisor support was associated with performance. The theorized indirect effect was also positive and significant ($\beta = 0.03$, $p < 0.001$), but small. This positive indirect effect indicates that supervisor support improves performance by reducing the strain caused by learning demands.

Overall, these results supported the assumptions we had drawn from the previous literature and from Study 1. The model fitted well to the data, and we found meaningful total, direct and indirect effects. Supervisor support was both directly and indirectly related to performance. The indirect path was mediated by reduced strain.

4.3 Study 2, Part B: Methods

From the same data set described above, we used the open-ended responses to the questions "What things has your supervisor managed well?" (n = 742) and "How could your supervisor better support you in your work during the exceptional circumstances?" (n = 518). All the items and responses were originally in Finnish. The open-ended questionnaire responses were analysed using semi-automated content analysis performed with Leximancer, as described above, (Study 1 Methods section).

4.4 Study 2, Part B: Results

In order to dig deeper into supervisor support, we performed a qualitative analysis of two open-ended questions that was similar to that in Study 1. In the Leximancer analysis that focused on aspects of work managed well by the supervisor, 20 concepts were identified. The concept map depicted in Fig. 4 illustrates the concepts and themes and their interconnections.

Table 6 presents the number of hits for each theme and representative respondent quotations. The most relevant and closely interconnected themes discussed in the responses were Informing, Contact, and Support. Regarding these themes the respondents described how their supervisors had succeeded in providing up-to-date information and instructions, in organizing regular meetings, in keeping in touch with both employees and students, and in providing support and encouragement.

At the top left of the concept map was the medium-sized Trust theme, which included descriptions of supervisors trusting their subordinates and granting them autonomy, and allowing them to work in the manner they deemed best without excessive monitoring or interference. Finally, the smaller Communication and Listening themes encompassed responses related to clear and fluent communication, as well as to an attentive and considerate attitude towards employees.

In the Leximancer analysis, which focused on how the supervisor could better support work during the exceptional circumstances 15 concepts were identified. The concept map depicted in Fig. 5 illustrates the concepts and themes, and their interconnections.

The number of hits for each theme and the representative respondent quotations are provided in Table 7. The most relevant and closely interconnected themes discussed in the responses were Enquiring after and Support. In the related responses, the respondents expressed a desire for more enquiries about their well-being and work situation as well as greater support from their supervisor. Some respondents specifically noted their need for additional support, such as assistance with the new technologies and tools used in remote work, or pedagogical guidance for remote teaching. Connected to the Support theme was a smaller Training theme, which also included responses related to the necessity for training in remote work, encompassing technical skills and the organization of remote teaching.

However, due to the phrasing of the question presented to the respondents, which included the term "support", about a third of the responses within the Support theme actually indicated that further support was not necessary.

Another cluster of themes emerged on the right side of the map encompassing the medium-sized Feedback and
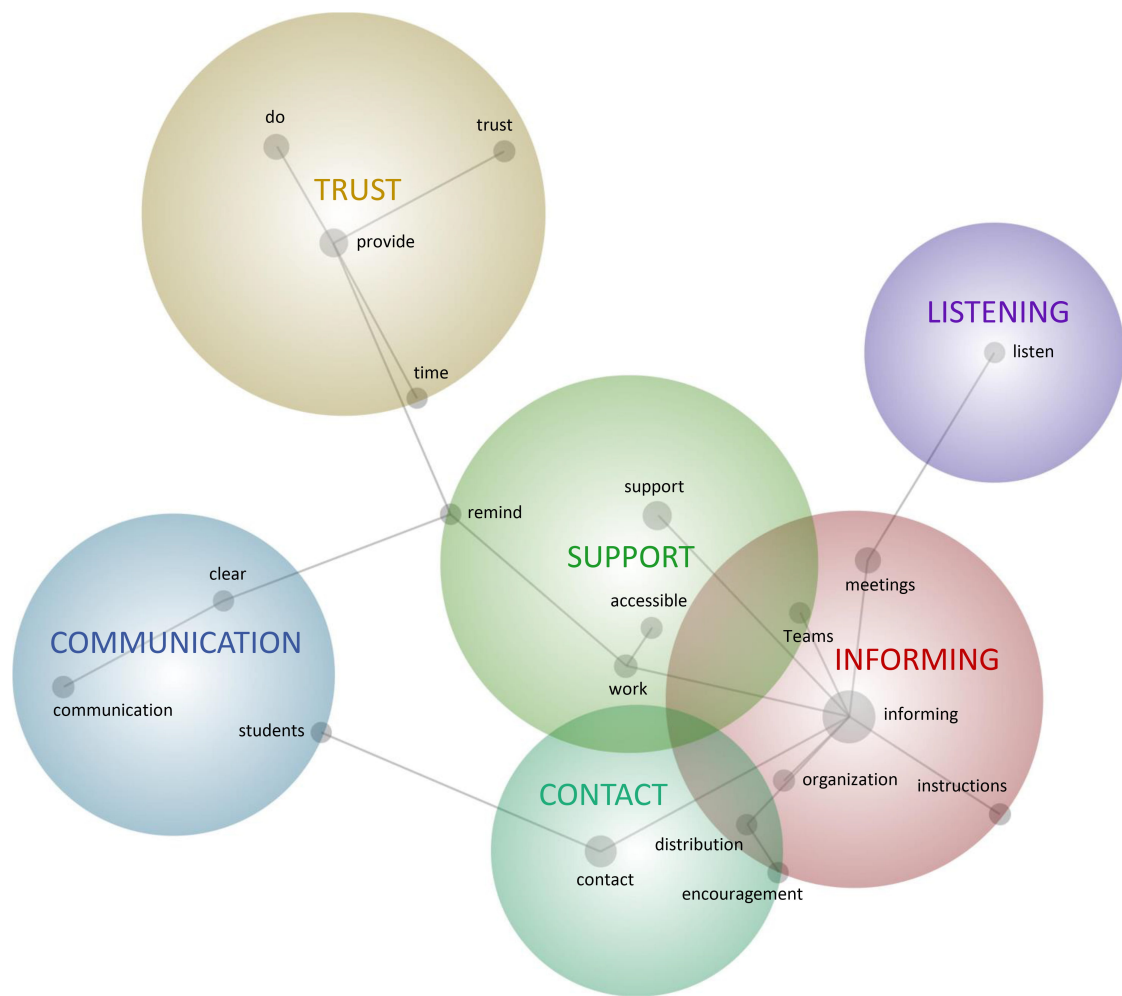
Fig. 4. Leximancer concept map of aspects managed well by supervisor.

Table 6. Themes and associated number of hits in leximancer analysis of aspects managed well by supervisor, and representative quotations.

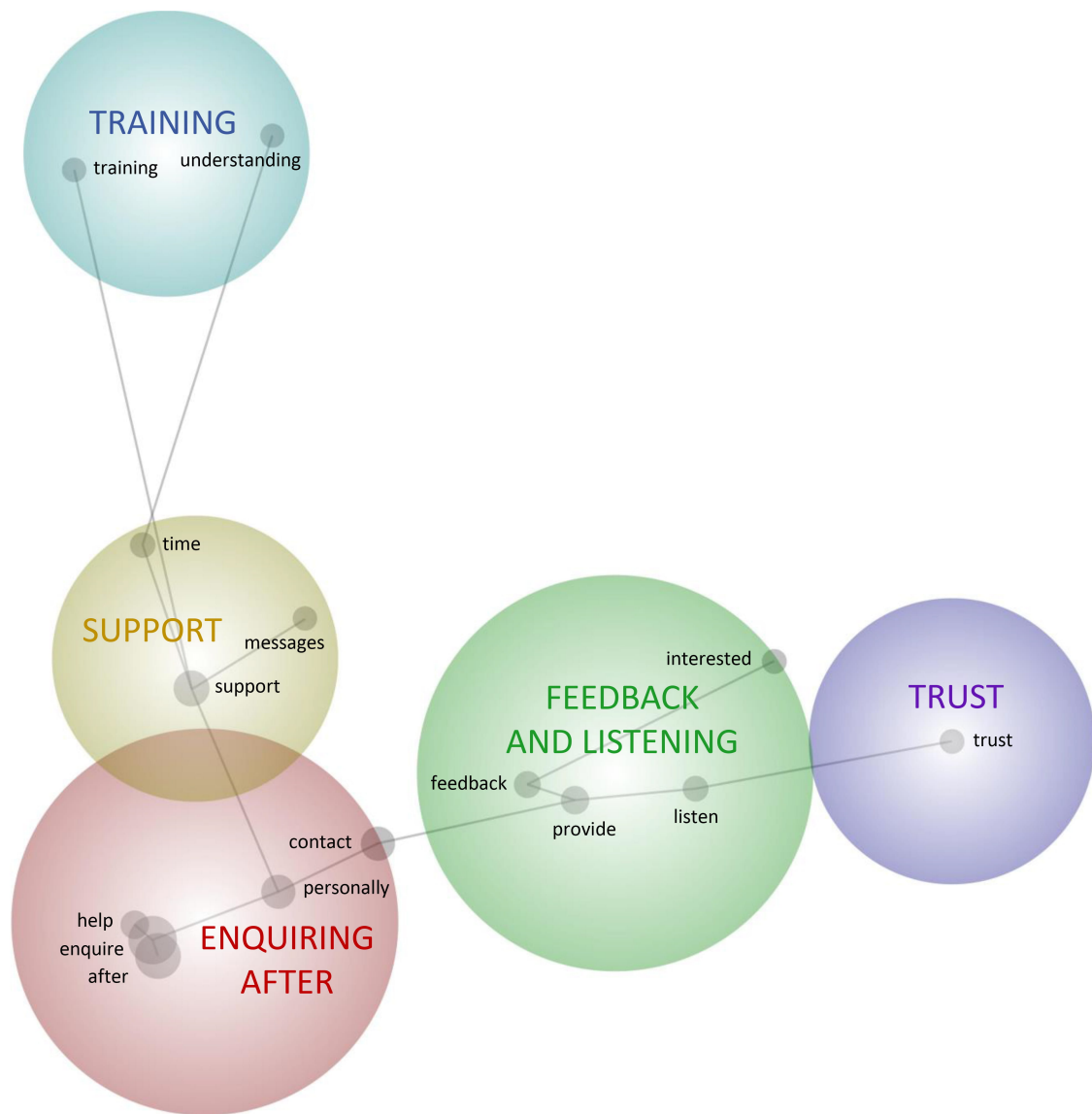| Theme	Hits	Representative quotations
Informing	221	"Teacher meetings on Teams and general informing."
		"The supervisor immediately created a WhatsApp group, where the most urgent messages and procedures were initially shared. Instructions have also otherwise been good and up-to-date in every way."
Contact	72	"Maintaining contact with teachers, pupils, and their parents. Not a single pupil is lost or unaware of where to get help."
		"Supervisor contacts the teachers directly when needed and is easily approachable."
Trust	71	"Supervisor allows teachers to do their work as they see fit, trusting their subordinates and not basing leadership on unnecessary orders or a command culture."
		"Supervisor is accessible but trusts and allows us to work in peace."
Support	27	"Encourages, supports, grants pedagogical freedom, is understanding, and reminds us to take care of our well-being."
		"We've received support. Supervisor has also been interested in our well-being."
Communication	27	"Communication has been smooth, and we've received support and guidance."
		"Communication with parents and teachers has been clear and up-to-date."
Listening	9	"The supervisor is easily approachable and listens to our joys and concerns. Has supported us to the best of their abilities."
		"Supervisor listens and engages in discussions."

Fig. 5. Leximancer concept map of how supervisor could better support work.

Table 7. Themes and associated number of hits in leximancer analysis of how supervisor could better support work, and representative quotations.

Theme	Hits	Representative quotations
Enquiring after	106	"Supervisor could have called everyone and asked how they're doing and if they need help." "Sometimes it would be nice if the supervisor called to ask how things are going. We discuss our news during video meetings, but I'd appreciate personal contact."
Support	58	"I'd appreciate more personal support and advice on pedagogical matters." "I'd still like low-threshold extra IT support and sharing common experiences of remote teaching."
Feedback and listening	33	"Personal feedback and listening." "Gives positive feedback."
Training	13	"Enables training for remote work." "When we switched to remote teaching, the teachers got no clear instructions or training on video teaching."
Trust	8	"Supervisor trusts that teachers are capable." "Supervisor trusts subordinates to do their job well."

listening theme alongside a minor Trust theme. The former comprised responses expressing a desire for more (personal and positive) feedback, as well as a wish to be heard by the supervisor. The latter included responses in which respondents described their wish that their supervisor would have faith in their expertise and ability to perform their tasks well.

4.5 Study 2: Discussion

Study 2 focused on the role of supervisor in the context of crises, and supported the view that the supervisor is an essential job resource for improving performance (Afzal et al, 2019; Legood et al, 2021). This is especially important during a crisis (Charoensukmongkol and Phungsoonthorn, 2020) as our result showed that an increase in supervisor support improves performance. Our results also reveal the underlying mechanisms (Charoensukmongkol and Phungsoonthorn, 2020) by which supervisors can help their subordinates perform better also during a crisis. In particular, we found that supervisor support reduced the strain caused by new learning demands and through this, positively affected employee performance. This represents a new contribution to the understanding of workplace dynamics, and the role of personal resources in JD-R theory (Schaufeli and Taris, 2014; Xanthopoulou et al, 2007). Our results show that as a job resource, a supervisor's support can affect personal resources and thus whether learning is experienced positively or negatively. Therefore, future studies should acknowledge the ways in which individuals appraise their job characteristics, which can depend on the specific work context and the individual (Bakker and Demerouti, 2017; Mazzola and Disselhorst, 2019; Schaufeli and Taris, 2014). Future studies should also consider taking other personal resources into account by, for instance, involving employees' values and attitudes towards their work in the study designs.

The findings of the analyses of the open-ended responses provide valuable insights into the specific aspects of supervisor support that are perceived positively by employees, as well as the areas in which improvement is desired, especially during exceptional circumstances such as those brought about by the COVID-19 pandemic. The analysis of open-ended responses revealed several key themes related to aspects of supervisory work that were perceived as important during the crisis. Informing, contact, and support emerged as the most prominent ways in which supervisors had supported their subordinates. The supervisor behaviour that was experienced as incomplete or lacking, the Enquire after and Support themes, further underscore the need for active involvement and tangible assistance from supervisors. These findings show that supervisors are expected to take a directive role (Riggio and Newstead, 2022; Wu et al, 2021), as employees appreciated supervisors who effectively provided timely and relevant information. This is not surprising, as a crisis is an unexpected situation and people have no previous experience in or information on how things should be solved (Wu et al, 2021). Thus, one of the most important roles of the supervisor during a crisis is to keep people updated and act as a guide in the uncertain situation.

However, emotional elements of supervisory work (Dasborough and Scandura, 2022) emerged more often in our data than the administrative or managerial tasks during the crisis situation. This finding is in line with those of earlier studies of leadership and performance (for a meta-analysis, see Legood et al, 2021; Peláez Zuberbühler et al, 2023; Tanskanen et al, 2019). The Communication, Listening and Enquiring after themes highlighted the significance of effective communication skills and an empathetic approach in supervisor behaviour. Clear and fluent communication was appreciated, as was a supervisor's ability to listen attentively and consider the perspectives of employees. These actions have the potential to contribute to a positive work environment in which employees feel valued and understood. The theme of feedback and listening emphasized how employees value positive feedback and acknowledgement of their contributions, rather than performance evaluations. This sentiment aligns with contemporary perspectives on performance management (DeNisi and Murphy, 2017). Employees appreciate an environment in which their efforts are recognized and in which they have the opportunity to voice their concerns and ideas. This is also in line with previous findings that have shown that supervisors develop adaptive and creative solutions in collaboration with their subordinates, to perform well in the new situation (Riggio and Newstead, 2022; Wu et al, 2021).

The Trust theme also stood out, indicating that supervisors who demonstrate trust in their employees by allowing autonomy and minimizing unnecessary monitoring are perceived positively. This finding supports previous research that highlights the importance of trust in supervisor-subordinate relationships (Dirks and Ferrin, 2002). When employees feel trusted, they are more likely to feel empowered and motivated, ultimately contributing to higher performance levels. Supervisor support, especially in the context of remote work technologies (Newman and Ford, 2021), was obviously needed. However, it is important to note that a portion of the responses within the support theme indicated that some employees felt they did not require additional support. This highlights that many of the supervisors had managed this challenging situation well but also that the individual needs of employees are different: whereas some may need a great deal of support, others may be satisfied with less.

5. General Discussion

The present study investigated employees' perceptions of the work context factors that either impair or have the potential to facilitate performance, and how these factors were associated with employees' appraisals of learning demands during the COVID-19 pandemic. The research also delved deeper into one of these facilitators, namely supervisor support. We employed a mixed-method approach

and conducted two separate studies to gain a comprehensive understanding of the topic. The results shed light on aspects of supervisor support and other factors that are critical for ensuring performance during crisis situations, and the associations between these and employees' appraisals of learning demands. By identifying hindrances to performance and highlighting effective solutions, supervisors can take proactive steps to help employees cope with new, sudden learning demands and competence requirements. The insights gained from this study contribute to the existing literature and offer practical implications for managing work-related challenges during times of crisis.

The findings of Study 1 illuminate the formidable challenges faced by educators during the pandemic. Work overload, large group sizes, and time pressure emerged as interrelated factors that characterized the educational landscape during these extraordinary times. These findings align with established research in the JD-R model, emphasizing the significance of workload, time pressure and work intensification (Afshari et al, 2022; Bakker et al, 2004; Gilboa et al, 2008; Scheel et al, 2023). Furthermore, unclear instructions and the role of supervisors also emerged as pivotal themes, highlighting the importance of effective communication and support structures during crises. These results corroborate prior research findings, emphasizing the adverse impact of reduced face-to-face interactions and communication challenges during the pandemic (Collie, 2022; Karatuna et al, 2022). The proposed solutions, especially those related to resource allocation, offer actionable strategies for enhancing performance in the face of these challenges.

As most of the challenges identified in Study 1 pertained to the supervisor or factors within their sphere of influence, Study 2 delved deeper into the role of supervisor support, revealing its profound impact on employees' personal appraisals of job demands and performance. First, the mediation analysis showed that supervisor support directly improved performance, while also exerting an indirect effect by alleviating the strain caused by new and sudden learning demands. Nonetheless, recent research underscores the significance of examining individual-level appraisals of job demands, as whether an individual perceives a situation as either a challenge or a hindrance appears to mediate whether it yields a positive or negative outcome (Li et al, 2021; O'Brien and Beehr, 2019; Webster et al, 2010).

Whereas the findings of Study 1 pointed out several themes related to administration and management, the qualitative data analysed in Study 2 highlighted the emotional side of leadership. It is possible that many of the grievances identified in Study 1 were not such issues that employees considered being under the control of their immediate supervisor but were a question of resourcing on a societal level or in upper management decisions. However, the findings of both studies highlight the pivotal role that supervisors play in fostering a conducive work environment, especially on the personal level, during times of crisis (Bakker and De-

merouti, 2017; Dasborough and Scandura, 2022; Stoker et al, 2022; Wu et al, 2021).

In summary, our study's primary contribution lies in revealing new insights into the role of social support as a critical resource during times of crisis, impacting both well-being (e.g., Usman et al, 2021) and employee performance. Our findings illuminate the significant interplay among job demands, job resources, and performance during crises. Specifically, our qualitative findings demonstrate that employees value certain factors as pivotal job resources contributing to smooth workflow, primarily related to elements that supervisors can control and support. Furthermore, our quantitative results emphasize that supervisor support not only directly enhances employee performance, but also indirectly alleviates the strain caused by the perception of new and sudden learning demands as positive or negative. Hence, our quantitative results enrich the Job Demands-Resources (JD-R) theory by providing empirical evidence for the understudied relationship between job demands and personal resources (Schaufeli and Taris, 2014), illustrating how they collectively influence employee performance during crises.

5.1 Practical Implications

The insights gained from this study hold significant practical implications for organizations aiming to navigate the challenges brought about by crises. Based on our findings, we suggest that resource allocation and support for planning and prioritizing work tasks holds the potential to significantly improve work outcomes. Furthermore, the themes of fixing problems and teamwork suggest practical approaches to mitigating specific challenges and fostering a collaborative work environment. The emphasis on functional work tools, training in their effective use (especially ICT), and clear instructions are important parts of supervisory work that further reinforce the importance of providing teachers with the necessary resources and support for optimal performance. In a crisis situation, supervisors should focus on gaining and sharing up-to-date information and ensure that everyone in the organization knows how to access the latest information. Second, supervisors should keep in contact with their subordinates and communicate with each of them regularly, providing a platform for open discussion and knowledge about individual needs of employees, building trust and empowering subordinates. As supervisors are important organizational agents and subject to heavy demands in a crisis situation, organizations should also provide support for them, for instance, training for interpersonal communication skills and ICT tools.

5.2 Limitations and Future Research

Our study utilized data from the education sector during COVID-19 as a representative illustration of the factors influencing workflow and performance during a crisis. Nevertheless, this also represents a limitation of our study, as our results may primarily reflect the experiences of edu-

cators in the Finnish context and may not be entirely generalizable to other contexts or crisis situations. Consequently, future research should aim to encompass a broader range of settings. Additionally, our study has other limitations, including the non-confirmatory nature of our mixed-methods approach. While the study provided new insights, there is a need to test the hypotheses derived from our results. For instance, longitudinal data should be employed to replicate the mediator models concerning the direct and indirect effects of supervisor support on employee performance. Furthermore, the qualitative results pertaining to the potential differences between the group that viewed learning as a hindrance and the group that viewed it as a positive challenge were not conclusive. Hence, future studies are necessary to explore the specific need for employee support among groups experiencing particular demands as either a challenge or a hindrance, which ultimately affects employee performance.

6. Conclusion

The results of this study provide a valuable foundation for the development of targeted interventions aimed at enhancing work performance in the educational sector during times of crisis. By addressing the identified challenges and implementing the proposed solutions, supervisors can create an environment that is conducive to sustained performance among their employees, even in the face of unprecedented challenges. Overall, this study offers a comprehensive exploration of the challenges and support mechanisms critical for sustained performance during crises, and its insights offer valuable guidance for organizations seeking to enhance supervisor support, ultimately leading to improved employee well-being and performance.

Availability of Data and Materials

The quantitative data that support the findings of this study are available upon reasonable request. The qualitative data analyzed in the current study are not available due to participant confidentiality concerns, but anonymized data may be available from the corresponding author upon reasonable request and with appropriate ethical approvals.

Author Contributions

All authors contributed to the design of the study. HL performed qualitative analyses, SK analysed the quantitative data, and SK was the main author of Study 2 part A. All authors contributed to writing and revising the manuscript, with VK and LM leading the work. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Conflict of Interest

The authors declare no conflict of interest.

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