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Lessons from the COVID-19 Pandemic: Preparing Higher Education for Future Disruptions

Abstract

Triggered by the COVID-19 pandemic, the spring 2020 shift to remote work in higher education offers lessons on how to navigate future institutional disruptions. This case study examines the wellbeing of staff who engaged in remote work at the Oulu University of Applied Sciences (OUAS) before and during the pandemic, with the aim of building crisis resilience in higher education. The study involved quantitative and qualitative analysis of a two-wave, cross-sectional, institution-wide online survey administered in June 2020 and June 2021 (n=77 and n=145). Identical items enabled comparisons; quantitative summaries and hybrid content analysis were mapped to a physical, cognitive, and organisational ergonomics framework. The findings highlight the importance of meaningful face-to-face interaction between staff and students. Reduced contact increased the need for a “sense of belonging” and “student guidance”, although roughly one quarter of respondents reported being largely satisfied with remote arrangements. Reported downsides included “non-stop work” patterns and perceived suboptimal workplace ergonomics. Overall, remote work was associated with diminished social interaction, with potential negative effects on staff wellbeing, collaboration, and the generation of new ideas, patterns consistent with prior pandemic-era research. Translating these insights into resilience principles for HEIs, we recommend: (1) designing hybrid routines that preserve peer contact and student touchpoints; (2) instituting workload boundaries and clear rhythms to prevent continuous work; (3) providing ergonomic support (equipment, micro-break norms, guidance) for home offices; and (4) segmenting support to accommodate differing staff needs while monitoring wellbeing over time. These measures can help HEIs purposefully sustain remote-work wellbeing during future disruptions.

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1. Introduction

The COVID-19 virus began spreading in early January 2020, leading to a global pandemic, including in Finland where this study was conducted (e.g., Sachs et al., 2022; Tiiirinki et al., 2020). In response to the pandemic, a range of societal restrictions were implemented from spring 2020 (e.g., Karreinen et al., 2023), including a transition to remote work (e.g., Kähkönen, 2023; McPhail et al., 2023). According to a survey conducted by the Finnish National Broadcasting company YLE (2020), more than 1 million of 2.7 million working Finns shifted to remote work during spring 2020. In higher education institutions, educational and non-educational staff were forced to change to remote work (Okeke-Uzodike & Ngo Henha, 2025). Remote work continued throughout the period of different viral variants and infection phases, as well as and increasing vaccination coverage, all the way to spring 2022. Presumably, these new practices and arrangements for remote work left lasting marks on knowledge work and higher education (e.g., Mäkelä et al., 2022; Tulaskar & Turunen, 2022).

Accelerated by the pandemic, remote work is now an integral way of working at higher education institutions. The current body of research on pandemic-induced remote work remains largely descriptive, focusing on immediate impacts rather than long-term systemic shifts (e.g., Hanu et al., 2025; Kyrönlahti et al., 2022; Singh et al., 2022). There is a need for research to track changes in practices and perceptions over time, particularly as remote work moves from a temporary necessity to a permanent feature of knowledge work (Ropponen, 2025). Much of the literature studies the individual, placing the burden of wellbeing on personal resources rather than addressing the systemic conditions that shape it (Robertson et al., 2012; Van Zyl et al., 2025). There is also a need to understand how teams and organisations adapt to remote or distributed work as work and personal life become more connected. Instead of aiming for a strict “balance” between the two, people may need a more flexible “flow” between their work and personal lives (Celbis et al., 2025). Considering all of the above, traditional ergonomic assessments focused on standardised office environments have become obsolete in this time of a distributed workforce. Frameworks need to be developed that recognise the diversity of home-based settings and individual adaptability (Caramelo Gomes, 2022).

The next crisis – e.g., a new pandemic or other global disruption – will again challenge society to align operations accordingly. Educational organisations must be willing to learn from the experiences of their personnel in order to be able to support them in the future to maintain their performance and wellbeing. Studying personnel experiences during the COVID-19 pandemic can help us understand what practices from face-to-face education should be incorporated into remote work to support wellbeing and productivity and to make it more meaningful. This study focuses on the evolution of remote work practices during the COVID-19 pandemic in a higher education context. The comparison of remote work practices and attitudes between 2020 and 2021 shows how academics navigated work routines and the technical and social challenges of the pandemic. The results of this study can be used to strengthen higher education remote-work practices during future disruptions.

2. Background

Remote working

Remote work provides staff with the flexibility to work away from conventional workplaces, as arrangements are more adaptable in terms of time and place. European and Finnish labour laws do not

expressly recognise the concept of remote work; instead, remote work is treated as a method of organising work to which general labour law principles apply (Rosin, 2024). As a result, remote work in Finland is generally governed by the Working Time Act, which requires monitoring of working hours (e.g., Ratti & García-Muñoz, 2024). In addition, employers are obliged to monitor the safety and health impacts of working practices regardless of where the work is conducted (e.g., Erikson & Rosin, 2025; Ratti & García-Muñoz, 2024). Adjusting the length of the working day is a key means of preventing excessive workload, since working remotely allows employees to more flexibly influence the organisation of their own working hours and set the pace of their work. On the other hand, remote working can also substantially reduce the number of daily social contacts, blurring the line between work and leisure (Cook, 2023; Eurofound, 2022; Grušić, 2022).

The introduction or expansion of remote work can affect the culture of the whole organisation (Charalampous et al., 2019; Pianese et al., 2022). Mutual trust is required between employee and employer to ensure work tasks are completed without direct supervision. Supervisors need the ability and willingness to adopt new supervision practices and likely also the capability to adapt to new management models and processes (Ojala & Pyöriä, 2013; Stavrova et al., 2023). More broadly, the entire organisation may need to adapt its culture and competences as personnel take greater responsibility for developing their own skills and abilities and keep up with changes in the working world. In that regard more employees are given more autonomy but also more responsibilities (Charalampous et al., 2019; Cook, 2023; De Vincenzi et al., 2022; Felstead & Henseke, 2017).

To perform remote work, self-management and associated professional competencies are required. Self-management can be a challenge for employees, as independent work skills are emphasised when working remotely. Elements of successful remote work and self-management include clearly defined task descriptions and objectives. Coordinated communication and collaboration methods, as well as adequate support and regular monitoring of goals, are also needed for remote work to be successful. Employees working remotely may face prejudices when the work environment is different from what they are used to, and the lack of traditional methods for monitoring working time can lead to concerns about work performance (Charalampous et al., 2019; Pianese et al., 2022).

In Finland, the popularity of remote work, especially in knowledge work, had steadily increased even before the pandemic. National statistics show that regular remote working increased from the 2010s. In 2010, 9% of all employees worked remotely and in 2019, a year before the COVID-19 pandemic started, the rate was 14% (Statistics Finland, 2020). Among upper-level salaried employees, as many as 59% worked remotely before the COVID-19 pandemic (Sutela et al., 2019).

Teaching remotely

Remote teaching has become more prevalent as schools and educational organisations transition to technology-mediated interactions to replace face-to-face teaching. As a result of the COVID-19 pandemic, the adoption and use of various digital tools has affected education and learning (Haleem et al., 2022). From the teacher's point of view, digitalisation allows resources to be allocated to the most important work tasks. Students, in turn, benefit from community, individual study paths, broader support, and content that adapts to contexts. Digitalisation is progressing at an accelerating pace, reforming education and creating multidimensionality in education (Haleem et al., 2022).

The rapid pivot to online instruction during the COVID-19 pandemic underscored a key distinction: emergency remote teaching is not the same as well-designed online learning. Effective remote courses are intentionally planned around clear outcomes, aligned activities, and appropriate assessments, rather than

simply transforming on-site lectures to videoconferencing (e.g., Al Abri & Elhaj, 2025; Fuchs, 2022). This distinction matters because quality online design is associated with equal or better learning outcomes compared with traditional formats when implemented thoughtfully. Remote teaching and learning are practical tools for continuous learning that have matured into robust infrastructures for continuous skill development across the professional lifespan. Research preceding and following the COVID-19 disruptions shows that when online environments are intentionally designed, they can match or surpass traditional outcomes, making them well-suited for ongoing, just-in-time learning (Bond et al., 2021).

Prior to the pandemic, Finnish higher education institutions were already equipped with strong foundations in digital technology. Supported by a national infrastructure, universities operated with high autonomy, utilising varied online lecturing tools, learning management systems like Moodle, and collaborative networks to offer flexible, lifelong learning. Despite this technological backbone and pedagogical knowledge (Mäkipää et al., 2022) the sudden shift to emergency remote teaching profoundly impacted the university ecosystem (Juntunen et al., 2022).

Wellbeing and ergonomics in remote work

Wellbeing at work is an ambiguous concept with no uniform definition (e.g., Bliese et al., 2017; Reiman & Väyrynen, 2018; Schulte & Vainio, 2010). Wellbeing should be considered from the physical, mental, and social perspectives. Despite being strongly associated with an individual's subjective perceptions and experiences of work, it also includes a more objective dimension through which wellbeing at work can be examined from a legal perspective in terms of employers' responsibilities. These include, for instance, legal obligations to ensure that the workplace is safe and possible physical, chemical, biological, and physiological hazards and risks of occupational accidents have been assessed and managed in an adequate manner (Reiman & Väyrynen, 2018; Schulte & Vainio, 2010). In addition, wellbeing at work can be associated with holistic wellbeing, which includes commuting and home and leisure time; here the blurred lines around remote working times are particularly relevant (e.g., Nowrouzi-Kia et al., 2024).

Table 1. Key elements of ergonomics domains, adapted from Erick & Smith (2011), Soltaninejad et al. (2021), and Abdul Rahim et al. (2022)

Domain	Relevant perspectives in teaching
Physical ergonomics	Arrangement of the physical work environment, including classroom or remote workspace layout, lighting, temperature, air quality and ventilation, interior design, and identification and management of safety hazards.
Cognitive ergonomics	Usability and appropriateness of teaching tools and technologies, as well as the effectiveness of teacher-student interaction interfaces.
Organisational ergonomics	Work schedule organisation, availability of peer support, clarity of instructions and guidance, and accessibility of feedback mechanisms.

Current research remains largely descriptive and focused on immediate transition impacts of remote work rather than long-term systemic shifts. There is a critical lack of research tracking how practices and perceptions change as remote work moves from temporary necessity to permanent feature. Furthermore, the relationship between individual and organisational resilience remains conceptually fragmented, with gaps in our understanding of the mechanisms through which individual adaptation translates into systemic stability.

3. Methodology

Context and research questions

The globally experienced transition to remote work practices due to the Covid-19 pandemic, driven by the need to maintain continuity of operations, rapidly transformed established work practices, offering valuable avenues for research not only from the organisational adaptability perspective but also related to individual experiences of the transition. This study focuses on the implications of pandemic-induced remote work within the context of higher education. The empirical part of our study focuses on pandemic-induced remote work practices in one higher education institution in Finland: Oulu University of Applied Sciences (OUAS). At OUAS, remote work, particularly in teaching, was already a rather well-established practice prior to the pandemic. The pandemic, however, accelerated the adoption of remote work, as all work at OUAS was ordered to be conducted remotely from spring 2020 onwards. To provide contextual background to this rapid and forced transition, Table 2 outlines the major organisational guidelines and restrictions related to remote work during the study period (Oulu University of Applied Sciences, 2021).

Table 2. Formal OUAS guidelines and restrictions on remote work practices by employees issued during the study period from spring 2020 to summer 2021

Academic semester	Timing	Guidelines and restrictions
Spring semester 2020	12.3.2020	<i>To prepare for the potential spread of the epidemic, staff were encouraged to keep their laptops and work cell phones with them so they could continue working remotely if necessary. Physical distancing was increased in all activities at OUAS. Webcasts of lectures and remote learning opportunities were increased. Remote work was encouraged when possible. All internal meetings were recommended to be conducted online. All travel was to be avoided. Campuses remained open until further notice.</i>
Autumn semester 2020	4.8.2020	<i>Teaching for first-year students was carried out on site, provided that it was possible to maintain a safety distance of at least one metre. If the required safety distances could not be maintained, teaching for first-year students was also conducted remotely.</i>
	21.8.2020	<i>Starting from 24 August, OUAS arranged for all possible teaching to be carried out remotely during the week. The change applied to all students. Staff were encouraged to work remotely when possible.</i>
	1.12.2020	<i>OUAS aimed to conduct as many activities as possible remotely. Campuses only hosted on-site classes that were absolutely necessary and in the smallest groups possible. The school instructed staff and students on teaching arrangements. OUAS staff continued to work remotely as much as possible. All meetings were conducted online. The main operating model at OUAS was the hybrid model.</i>

Spring semester 2021	11.1.2021	<i>Campuses remained open, but all activities were carried out mainly remotely. OUAS continued the spring semester in line with its previous hybrid-model policy. Campuses hosted only mandatory teaching in strict accordance with safety and hygiene guidelines.</i>
	5.2.2021	<i>OUAS continued to follow the hybrid model as previously planned until 31 May, in accordance with the recommendations of the authorities.</i>
	2.3.2021	<i>OUAS continued to follow a model in which only essential classes were held on campus in accordance with safety and hygiene guidelines. Theoretical studies were implemented remotely.</i>
	27.4.2021	<i>OUAS stated that staff and students would return to campuses as soon as it was safe. OUAS continued mainly in remote mode until 31 July. However, campuses remained open for activities such as independent study, and the library and restaurants were operational.</i>

The aim of this study was to investigate remote work practices among OUAS staff and to analyse them through the lens of ergonomics. To study this more specifically, the following two research questions (RQ) were defined:

- RQ1: What changes occurred in remote work practices among OUAS staff during the pandemic?
- RQ2: From an ergonomics perspective, how were these work practices perceived by OUAS staff?

Data collection

For empirical data collection, this case study (Yin, 2018) used a two-wave repeated cross-sectional survey (hereinafter referred to as Surveys 1 and 2) tailored for the purpose by the authors. A pilot survey was administered with OUAS colleagues (n=3) beforehand. The survey structure and questions can be viewed in Appendix 1. The online surveys were created with the Webropol tool (Webropol, 2022) and disseminated to all OUAS personnel in June 2020 and 2021, just before the summer holiday period. The timing was chosen as teachers have fewer teaching responsibilities then and all personnel would have the opportunity to complete the survey unhurried. The surveys were live for nine days and two reminders were sent to increase answer rates.

Table 3 summarises the respondent demographics of both surveys. According to staff statistics (Oulu University of Applied Sciences, 2022), the total number of OUAS staff declined slightly (-6.5%) and the gender distribution shifted slightly between 2020 and 2021. The proportion of younger (26-39 years) and older (over 60 years) respondents increased (+6.8% and +11.5%) respectively, while the proportion of middle-aged (40-49 years and 50-59 years) respondents decreased (-13.1% and -5.3%). The proportion of teachers decreased (-11.6%), while the proportion of project workers and administrative staff slightly increased. The biggest changes in terms of respondents' departments were the decrease in respondents from the School of Media and Performing Arts (-12.7%) and the increase in respondents from the School of Engineering and Natural Resources (+15.8%).

Table 3. Survey respondent demographics

		Survey 1, N=77	Survey 2, N=145	Change between Survey 1 and Survey 2
OUAS staff 2020–2021	Total OUAS staff at the time of the survey	493	461	-32, -6.5%
	Percentage of female staff	55%	54%	-1%
Respondent's gender	Male	29.9%	33.8%	+3.9%
	Female	67.5%	62.8%	-4.7%
	Other	2.6%	3.4%	+0.8%
Respondent's age	Less than 25 years	1.3%	1.4%	+0.1%
	26–39 years	9.1%	15.9%	+6.8%
	40–49 years	44.1%	31.0%	-13.1%
	50–59 years	37.7%	32.4%	-5.3%
	Over 60 years	7.8%	19.3%	+11.5%
Respondent's role	Teacher	68.8%	57.2%	-11.6%
	Project worker	6.5%	9.7%	+3.2%
	Administrative or support services	6.5%	9.7%	+3.2%
	Teacher and project worker	18.2%	23.4%	+5.2%

Respondent's OUAS unit	School of Business Administration	23.3%	19.3%	-4.0%
	School of Social and Health Care	22.1%	24.1%	+2.0%
	School of Information Technology	19.5%	13.8%	-5.7%
	School of Media and Performing Arts	16.9%	4.2%	-12.7%
	School of Engineering and Natural Resources	10.4%	26.2%	+15.8%
	School of Professional Teacher Education	3.9%	7.6%	+3.7%
	Administration and Quality	3.9%	4.8%	+0.9%

Data analysis

The analysis of survey responses was carried out by two authors. The number of respondents varied between the surveys (Survey 1 $n=77$, response rate 15.6%; Survey 2 $n=145$, response rate 31.5%), hence relational comparison was applied in the analysis causing the quantitative results to be descriptive. Cross-wave percentage comparisons offer a standardised way to analyse trends across different populations ensuring that differences are not due to sample size variations but reflect actual changes, or trend interpretations, in respondents' behaviours or opinions (Fowler, 2009). Comparisons between the two survey waves should be interpreted as descriptive differences between two cross-sectional samples rather than as evidence of longitudinal change among individual staff members.

For RQ1, survey responses were statistically analysed, including numbers and percentages. For RQ2, responses to open-ended questions were analysed using hybrid content analysis: inductive thematic coding (Krippendorff, 2018; Mayring, 2004) using a qualitative data analysis tool (QCAmap, 2026), followed by deductive content mapping based on the three ergonomics domains and coding criteria presented in Table 1. In both analyses, data coding of responses to both surveys was restricted to one mention per participant, with results calculated relative to the total sample sizes of Survey 1 and Survey 2. The analysis began by coding responses for their most essential contents, thereby constructing a basic coding framework for the dataset. The coded data extracts were then organised into potential themes, after which recurring themes were identified (Braun and Clarke, 2006). Examples of the coding process are summarised in a table in Appendix 2. The contents and accuracy of the categorisations and produced results were cross-checked and discussed in a meeting by the other two researchers.

4. Results

In Survey 1 (spring 2020), a majority of respondents (75.3%; n=58) reported working remotely at least once a week while only five (6.5%) respondents had never worked remotely before the pandemic. During the spring of 2020, 93% of all respondents conducted more than 90% of their work remotely. In spring 2021, meanwhile, 66% of all respondents reported conducting more than 90% of their work remotely. Based on the results, the amount of work done remotely decreased between Surveys 1 and 2.

RQ1 addresses shifts in work practices between spring 2020 and spring 2021. Comparative analysis of Survey 1 and Survey 2 (Table 4) showed differences in remote work practices. The data indicate that more physical activity (16.9% to 20.7%) was integrated into the workday in spring 2021, with a decline in respondents reporting total inactivity (28.6% to 19.3%). While the use of dedicated remote workspaces remained stable, synchronous engagement remained high. However, the proportion of respondents in leadership or hosting roles (“I have chaired or convened a remote meeting”) declined slightly. Regarding independent vs. collaborative work, independent tasks including planning, writing, and teaching remained the most frequent activities, with around 60% of respondents reporting conducting these “several times a day” across both years. Conversely, remote group work intensified, showing a slight uptick in high-frequency participation (20.8% to 25.5%). Pedagogical patterns shifted; while webinar participation remained the same, the number of lecturers hosting webinars “daily” (7.8% to 8.3%) or “several times a day” (2.6% to 7.6%) grew. Regarding the social dimension, social interaction showed the most significant decline between surveys. Virtual coffee breaks with colleagues were less frequent in spring 2021 (average 2.3 to 2.0) and the number of “not at all” responses increased (14.3% to 27.6%). Furthermore, remote lunch breaks remained an outlier practice, with over 80% of respondents never participating in them in either survey period.

Table 4: The frequency of various remote working practices according to Surveys 1 and 2

	I have not done this at all (1)	Once a month or less (2)	Once a week or more (3)	Daily (4)	Several times a day (5)	Average	Median	Standard deviation
2020: I've been exercising before or during the remote working day.	28.6%	19.5%	33.7%	16.9%	1.3%	2.4	3.0	0.1
2021: I've been exercising before or during the remote working day.	19.3%	27.6%	32.4%	20.7%	0.0%	2.5	3.0	0.1
2020: I have worked remotely from an established remote workstation or room.	9.1%	0.0%	5.2%	37.7%	48.0%	4.2	4.0	0.2
2021: I have worked remotely from an established remote workstation or room.	6.2%	2.1%	11.7%	37.9%	42.1%	4.1	4.0	0.2
2020: I have participated in a remote meeting.	0.0%	2.6%	51.9%	26.0%	19.5%	3.6	3.0	0.2
2021: I have participated in a remote meeting.	0.0%	2.7%	48.3%	29.0%	20.0%	3.7	3.0	0.2

2020: I have chaired or convened a remote meeting.	5.2%	24.7%	48.0%	10.4%	11.7%	3.0	3.0	0.2
2021: I have chaired or convened a remote meeting.	6.9%	25.5%	44.1%	13.1%	10.4%	2.9	3.0	0.2
2020: I have done independent work remotely, e.g. planning, writing, teaching, mentoring, tutoring.	0.0%	2.6%	3.9%	33.8%	59.7%	4.5	5.0	0.3
2021: I have done independent work remotely, e.g. planning, writing, teaching, mentoring, tutoring.	0.7%	0.0%	7.6%	29.0%	62.7%	4.5	5.0	0.3
2020: I have worked remotely in groups, e.g. planning, writing, tutoring.	2.6%	10.4%	41.5%	24.7%	20.8%	3.5	3.0	0.1
2021: I have worked remotely in groups, e.g. planning, writing, tutoring.	2.1%	11.7%	38.6%	22.1%	25.5%	3.6	3.0	0.1
2020: I have taken part in distance learning (webinars) as a participant.	7.8%	44.1%	40.3%	5.2%	2.6%	2.5	2.0	0.2
2021: I have taken part in distance learning (webinars) as a participant.	3.4%	53.1%	33.8%	2.1%	7.6%	2.6	2.0	0.2
2020: I have participated in distance learning (webinar) as a lecturer.	32.4%	26.0%	31.2%	7.8%	2.6%	2.2	2.0	0.1
2021: I have participated in distance learning (webinar) as a lecturer.	25.5%	30.4%	24.8%	8.3%	11.0%	2.5	2.0	0.1
2020: I have had lunch remotely with a colleague / friends.	85.7%	13.0%	1.3%	0.0%	0.0%	1.2	1.0	0.4
2021: I have had lunch remotely with a colleague / friends.	83.4%	14.5%	1.4%	0.0%	0.7%	1.2	1.0	0.4
2020: I have had a coffee break remotely with a colleague / friends.	14.3%	39.0%	45.4%	1.3%	0.0%	2.3	2.0	0.2
2021: I have had a coffee break remotely with a colleague / friends.	27.6%	46.2%	22.1%	2.7%	1.4%	2.0	2.0	0.4

RQ2 addresses work practices from an ergonomics perspective. Table 5 summarises the work practices survey respondents missed when working remotely (2nd level coding + ergonomics domain).

Table 5. Percentage of respondents reporting missing certain work practices during remote work periods

Work practice	Ergonomics domain	Survey 1 (%)	Survey 2 (%)	Difference, Survey 1 – Survey 2 (%)
Dining with colleagues/friends	Physical & Cognitive	13	12	-1

Shared coffee breaks	Physical & Cognitive	10	17	+6
Copiers	Physical	8	1	-7
Dedicated room for working	Physical	8	1	-7
Workstation arrangement	Physical	0	4	+4
Face-to-face interaction with staff or students	Cognitive & Organisational	68	66	-2
Face-to-face teaching	Cognitive	16	17	+1
Student guidance	Cognitive	0	7	+7
Creative teamwork	Organisational	8	3	-5
Sense of belonging	Organisational	0	6	+6

Table 6 summarises the remote work practices survey respondents would like to eliminate (2nd level coding + ergonomics domain).

Table 6. Percentage of respondents reporting they would like to eliminate certain remote work practices

Work practice	Ergonomics domain	Survey 1 (%)	Survey 2 (%)	Difference, Survey 1 – Survey 2 (%)
None (there are no practices I would like to eliminate)	-	21	23	+2
Prolonged sitting	Physical	12	2	-10
Poor remote work conditions	Physical	3	5	+2

Working from home	Physical	4	1	-3
Working alone	Organisational	0	3	+3
Remote teaching	Cognitive	5	10	+5
High volume of emails	Cognitive	3	7	+4
Remote meetings	Organisational	6	3	-3
Long workdays	Organisational	6	4	-2
Non-stop working	Organisational	0	12	+12
Long, overextended meetings	Organisational	0	3	+3

From the physical ergonomics perspective, as can be observed from Tables 5 and 6, a small shift occurred toward better physical ergonomic practices during remote working, as can be seen with the items “workstation arrangement” (+4%) and “poor remote work conditions” (+2%). This is consistent with employee adaptation to remote working and supported by the decline in respondents missing physical work tools such as “copiers” (-7%) and the “dedicated room for working” (-7%). At the same time, fewer respondents found “prolonged sitting” (-10%) to be a problematic practice they would like to eliminate from their remote work. From a physical ergonomics standpoint, suboptimal home setups and exposure elevate physical load and fatigue, which degrade physical wellbeing. Conversely, supportive layouts, lighting, and movement routines reduce strain. Teachers’ call to address “poor ergonomics” are therefore directly interpretable as a design gap in the physical domain.

From the cognitive ergonomics perspective, work-related activities (meetings, independent work, teamwork) were as common or slightly more common in spring 2021, implying that core workflows could be executed online. Yet employees more commonly wanted to reduce the volume of emails (+4%) and “remote teaching” (+5%), classic symptoms of fragmented attention and cumulative cognitive load in digital environments. Over the whole study period, the relatively high desire for formal and informal face-to-face interactions – such as “dining with colleagues/friends” (13% & 12%), “shared coffee breaks” (10% & 17%) with other teachers, and “face-to-face teaching” (68% & 66%) – remained, indicating longing for physical interaction. Remote work may imply reduced opportunities for spontaneous ideation, information sharing, and lightweight problem-solving, potentially leading to more scheduled meetings and fuller inboxes. This aligns with the cognitive domain’s focus on usability and interfaces: well-tuned platforms reduce error and frustration, whereas poorly bounded meeting/email practices increase mental effort and fatigue. The combination of maintained “prolonged sitting” and rising “meeting/email” pain points suggests digital rhythms may need to be redesigned rather than the tools per se.

Finally, from the organisational ergonomics perspective, it can be observed that across both waves of the study, staff missed face-to-face interaction most, and by 2021 they commonly emphasised the need for community and student guidance. Survey 2 revealed staff missed the “sense of belonging” (+6%) and “student guidance” (+7%), indicating an emerging phenomenon. The responses indicated longing for activities needed to build and maintain a work community. The loneliness of remote work seemed to lead to a need for interaction and ultimately reduced feelings of community. A slightly less common desire was for “creative teamwork” (-5%), indicating a need to renew teamwork practices, possibly due to unsuccessful trials of remote ideation in the early phases of the pandemic. New practices that staff wanted to eliminate included “non-stop working” (+12%), pointing to weakened social support and blurred boundaries in remote modes. These are typical organisational ergonomics issues: how time is structured, how feedback and guidance flow, and how peer support is arranged.

As remote working became normalised alongside some voluntary campus return, satisfaction with remote work conditions (“there are no practices I would like to eliminate”) remained high between surveys (21% & 23%). To clarify this more analysis of respondents’ OUAS unit, age, and role was performed for Survey 2 when 23% of all respondents stated “there are no practices I would like to eliminate”. Based on this analysis, those staff who were most satisfied with remote work were 55+ years old (44% satisfied), teachers (37% satisfied), and working in the School of Information Technology (SIT) (55% satisfied). Typically, staff are more independent and less reliant on peer support in the later phases of their career. This is especially common in the ICT sector, where most work tasks are more suitable for remote teaching practices.

5. Discussion and Conclusion

This study examined remote work during the COVID-19 pandemic in one Finnish higher education institution, Oulu University of Applied Sciences (OUAS).

OUAS personnel were already highly engaged in remote work prior to the pandemic, with roughly 75% of respondents already working remotely more than once a week, which likely mitigated the disruption of the forced remote work transition in the beginning phase of the pandemic in spring 2020. Although practices and prevalence varied by role, the institution’s baseline familiarity with remote modes helped sustain its operations. This argument is consistent with observations from another Finnish higher education institution that also shifted to remote formats relatively smoothly in a relatively short period in spring 2020 (e.g., Trade Union of Education in Finland, 2020). Although remote working became normalised between the two surveys (conducted in spring 2020 and spring 2021), it also became less common. Based on the results, it can be concluded that staff were motivated to return to campus, as they were not specifically instructed to return in the OUAS guidance issued around the time.

Face-to-face interaction with colleagues and students was the most missed practice during the COVID-19 pandemic. This was highlighted by mentions of missing contact teaching, shared coffee breaks, and workplace dining. Working alone too much, a lack of shared breaks, and extended online meetings were other commonly cited concerns related to remote work among personnel. These observations align with other studies conducted in Finland during the COVID-19 pandemic (e.g., Juntunen et al., 2022; Mäkelä et al., 2022; Myyry et al., 2022; Uusiautti et al., 2024). The response “I did not miss any work practices” was similarly common in both surveys (21% to 23%), with almost a quarter of respondents generally satisfied with their remote work arrangements and practices. This may also be due to the increased hybrid (both remote and on-campus) work, as the results for RQ1 indicate. This finding echoes those of previous studies with Finnish university personnel and students by Tapani et al. (2022) and Lavonen and Salmela-Aro, (2022), as well as those from other contexts by Waldrep et al. (2024) and Criscuolo et al. (2021), while more critical attitudes were found by Leal Filho et al. (2025). There is a potential risk here – when working-time arrangements and feedback/peer channels are not actively redesigned for remote conditions, isolation and

over-extension emerge, undermining mental and social wellbeing. Restoring informal contact and clarifying norms for availability/response are therefore not “soft” extras but core design variables for work wellbeing.

During the pandemic, new and much-needed practices emerged between the surveys, as the results related to needs for “creative teamwork”, “sense of belonging”, “student guidance” and “workstation arrangement” highlight. The desire for community (belonging) is related to the reduction in face-to-face interaction with colleagues and students. The emergence of a desire for student guidance may be associated with the research finding that student wellbeing deteriorated during the COVID-19 pandemic (e.g., Pappa et al., 2020; Sarasjärvi et al., 2022), and especially the observations of teaching staff about this. A desire for “better workstation arrangement” may be associated with inactivity when working for long periods (“non-stop working”), i.e., the physical conditions of extended remote working periods and a need for more movement during working time. The decline in mentions of missing the “copier” and “dedicated room for working” may be related to the stabilisation of remote work practices.

Viewed through an ergonomics framework, the findings indicate that remote work at OUAS enabled core tasks to be completed but exposed uneven ergonomics across the physical, cognitive, and organisational domains. On the physical side, small gains in “coffee-break routines” and “occupational ergonomics” suggest adaptation, yet the increase in mentions of “prolonged sitting” and “poor home setup” point to unresolved issues related to workstation arrangement, movement, and recovery. Cognitively, stable or increased levels of meetings, independent work, and teamwork indicate that work efforts were maintained. However, the desire to reduce “email volume” and “remote teaching” reflects fragmented attention, cumulative cognitive load, and suboptimal digital rhythms rather than tool deficits. Organisationally, the most missed elements involved “face-to-face interaction”, with increased desire for “community” and “student guidance”, while there was a slight drop in desire for “creative teamwork” and signs of blurred boundaries causing “non-stop working”. The study findings support those of previous studies in Finland by Kyrönlahti et al. (2022), Oksanen et al. (2023), and Kausto et al. (2024).

Managerial implications

Based on the study, higher education institutions should shift from reactive management to purposeful resilience-building by following these recommendations:

1. Design hybrid routines that preserve student/peer touchpoints. The study results show a desire for a “sense of belonging”, which is related to the reduced physical interaction with students and colleagues (the most frequently missed practice). It is important to provide means for staff to maintain meaningful interaction with students and colleagues. The reduced opportunity for “spontaneous meetings” and “lightweight problem-solving” potentially pushed staff toward more scheduled meetings and thus fuller email inboxes, again causing cumulative cognitive load.
2. Set workload/availability boundaries to avoid continuous work and suboptimal digital rhythms. The study showed staff were concerned about “non-stop working”, working alone too much, the lack of shared breaks, “meeting/email” pain points, and “extended online meetings”. This points to weakened social support and blurred boundaries in remote modes. The organisation or work community should openly discuss, share, and agree on methods and norms for setting limits for continuous remote work.
3. Provide ergonomic support for home offices. Staff reported downsides including perceived suboptimal workplace ergonomics (“workstation arrangement”) and a lack of engagement in “physical activity before or during remote work”. Just as ergonomic checks are provided in offices, home workstation checks should be carried out by work ergonomics experts, for example via remote visits utilising a web camera.

4. Segment support for different staff needs and monitor wellbeing over time. Both study surveys found that almost a quarter of respondents were generally satisfied with remote work arrangements. However, institutions need to recognise that staff engaging in remote work have different needs and their attitudes can change over time.

Although calls for staff to return to offices persist (e.g., Gibson et al., 2023), the transition to a distributed higher education environment is no longer a matter of debate but a permanent structural reality. While remote work offers flexibility, it presents a threat to the relational foundations of institutions. Strengthening institutional resilience requires a shift from viewing wellbeing as an individual responsibility to recognising it as a systemic imperative. By paying attention to the physical, cognitive, and organisational ergonomics of work, higher education institutions can transform the “crisis response” into a robust, sustainable, and equitable post-digital ecosystem. Despite the findings of strong intentions to maintain remote work, observed reductions in community interaction involve a potential risk of eroding the collaborative knowledge creation essential for organisational regeneration.

Limitations and future research

The study has a few key limitations. First, the organisational response rates for the surveys were limited (15.6% in 2020 and 31.5% in 2021), which may reduce their representativeness, while the wave-to-wave compositional differences limit the generalisability of the findings. Observed differences may reflect differences in sample composition or response rates, rather than necessarily indicating a true change in the target population. Second, the data were collected only through surveys, naturally limiting the depth of contextual insight. The lack of objective indicators and methodological triangulation reduced our ability to explore underlying mechanisms behind the observed patterns. Consequently, the results should be interpreted with caution and viewed as a descriptive basis for further, mixed-methods inquiry. Future research should replicate this study using a similar survey in OUAS to track changes in practices over time, for example, the impact of remote working on the creation of social capital and new knowledge by the organisation.

Declarations

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Ethical Approval: Ethical approval was not required. The research followed the ethical principles set out by the Finnish National Board on Research Integrity TENK concerning research with human participants, including respect for participants’ dignity and autonomy, avoidance of harm, protection of privacy, and responsible processing of personal data. TENK states that ethical review in human sciences focuses on advance assessment of a research plan, particularly the prevention of possible harm to participants.

Conflicts of Interest: All authors declare that they have no conflicts of interest.

Informed Consent: The participants were informed in an email and an intranet message about the surveys focusing on their remote working experiences. Both messages included data privacy notification and confirmed that no sensitive or confidential data (e.g., medical and behaviour records, academic performance reports, etc.) would be collected by the survey. Furthermore, survey responses were not traceable to specific persons in OUAS, as participants were not required to provide their names or other identifiable information.

AI Usage, Data Privacy, and Voluntary Participation: OpenAI’s ChatGPT v. 5 was used in exploration of previous research and to improve the grammar of the paper. No ChatGPT outputs in text format were directly inserted into the article during its preparation. The following information for participants was included in both surveys: “By responding to the survey, you decide to participate in the research and give

the researchers permission to use the information you provide for research purposes. The confidentiality of your data will be ensured, and only the researchers will have access to the material. The data will be destroyed after two years unless otherwise agreed with you. The confidentiality of participants' information is ensured in accordance with the General Data Protection Regulation (GDPR) of April 27, 2016, and Finland's Law 3/2018 on the protection of personal data and digital rights. For this reason, the data will be stored in the digital folder of the research project, accessible only by the researchers. Participation in this research on the learning process is entirely voluntary. If you have any concerns or questions, you can contact the researchers via email."

6. References

- Abdul Rahim, A. A., Jeffree, M. S., Ag Daud, D. M., Pang, N., & Sazali, M. F. (2022). Factors associated with musculoskeletal disorders among regular and special education teachers: A narrative review. *International Journal of Environmental Research and Public Health*, 19(18), 11704. <https://doi.org/10.3390/ijerph191811704>
- Al Abri, M., & Elhaj, A. (2025). Quality criteria for online courses development. *International Review of Research in Open and Distributed Learning*, 26(2). <https://doi.org/10.19173/irrodl.v26i2.7315>
- Bliese, P. D., Edwards, J. R., & Sonntag, S. (2017). Stress and well-being at work: A century of empirical trends reflecting theoretical and societal influences. *Journal of Applied Psychology*, 102(3), 389–402. <https://doi.org/10.1037/apl0000210>
- Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2021). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education*, 18, 50. <https://doi.org/10.1186/s41239-021-00282-x>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Caramelo Gomes, C. (2023). On site or remote? A time to reimagine the workplace. In D. Raposo, J. Neves, R. Silva, L. Correia Castilho, & R. Dias (Eds.), *Advances in design, music and arts*, vol. 25 (pp. 424–440). Springer Series in Design and Innovation. https://doi.org/10.1007/978-3-031-09659-4_32
- Celbis, O., van de Laar, M., & Volante, L. (2025). Resilience in higher education during the COVID-19 pandemic: A scoping literature review with implications for evidence-informed policymaking. *International Journal of Educational Research Open*, 8, 100392. <https://doi.org/10.1016/j.ijedro.2024.100392>
- Charalampous, M., Grant, C. A., Tramontano, C., & Michailidis, E. (2019). Systematically reviewing remote e-workers' well-being at work: A multidimensional approach. *European Journal of Work and Organizational Psychology*, 28(1), 51–73. <https://doi.org/10.1080/1359432X.2018.1541886>
- Cook, D. (2023). What is a digital nomad? Definition and taxonomy in the era of mainstream remote work. *World Leisure Journal*, 65(2), 256–275. <https://doi.org/10.1080/16078055.2023.2190608>
- Criscuolo, C., Gal, P., Leidecker, L., Losma, F., & Nicoletti, G. (2021). *The role of telework for productivity during and post-COVID-19: Results from an OECD survey among managers and workers* (OECD Productivity Working Papers No. 31). OECD Publishing. <https://doi.org/10.1787/7ef47950-en>
- De Vincenzi, C., Pansini, M., Ferrara, B., Buonomo, I., & Benevene, P. (2022). Consequences of COVID-19 on employees in remote working: Challenges, risks and opportunities—An evidence-based literature review. *International Journal of Environmental Research and Public Health*, 19(18), 11672. <https://doi.org/10.3390/ijerph191811672>

- Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., Wilson, J. R., & van der Doelen, B. (2012). A strategy for human factors/ergonomics: Developing the discipline and profession. *Ergonomics*, 55(4), 377–395. <https://doi.org/10.1080/00140139.2012.661040>
- Erick, P. N., & Smith, D. R. (2011). A systematic review of musculoskeletal disorders among school teachers. *BMC Musculoskeletal Disorders*, 12, 260. <https://doi.org/10.1186/1471-2474-12-260>
- Erikson, M., & Rosin, A. (2025). Protection of the occupational health and safety of teleworkers. *European Labour Law Journal*, 16(2), 228–244. <https://doi.org/10.1177/20319525241300078>
- Eurofound. (2022). *Telework in the EU: Regulatory frameworks and recent updates*. Publications Office of the European Union. <https://www.eurofound.europa.eu/publications/report/2022/telework-in-the-eu-regulatory-frameworks-and-recent-updates>
- Felstead, A., & Henseke, G. (2017). Assessing the growth of remote working and its consequences for effort, well-being and work–life balance. *New Technology, Work and Employment*, 32(3), 195–212. <https://doi.org/10.1111/ntwe.12097>
- Finnish Broadcasting Company (YLE). (2020, April 16). *Ylen kysely: Yli miljoona suomalaista siirtynyt etätöihin koronaviruksen aikana – heistä noin puolet haluaa jatkaa etätöissä koronan jälkeenkin* [Yle poll: More than one million Finns moved to remote work during the corona crisis—about half of them want to continue working remotely even after the corona crisis]. <https://yle.fi/uutiset/3-11291865>
- Fowler, F. J. Jr. (2009). *Survey research methods* (4th ed.). Sage. <https://doi.org/10.4135/9781452230184>
- Fuchs, K. (2022). The difference between emergency remote teaching and e-learning. *Frontiers in Education*, 7, 921332. <https://doi.org/10.3389/feduc.2022.921332>
- Gibson, C. B., Gilson, L. L., Griffith, T. L., & O'Neill, T. A. (2023). Should employees be required to return to the office? *Organizational Dynamics*, 52(2), 100981. <https://doi.org/10.1016/j.orgdyn.2023.100981>
- Grušić, U. (2022). *Remote working and European private international law* (Policy Brief No. 2022.14). ETUI. <https://www.etui.org/publications/remote-working-and-european-private-international-law>
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.003>
- Hanu, C., Dzandu, M., Amegbe, H., Pathak, B. (2025). Adapting ergonomics and human factors in remote work for employee well-being: A conceptual study. In H. Kalkis & Z. Roja (Eds.), *Social and occupational ergonomics* (pp. 65–72). AHFE Open Access. <https://doi.org/10.54941/ahfe1006598>
- International Ergonomics Association (n.d.). *What is ergonomics (HFE)?* <https://iea.cc/about/what-is-ergonomics/>
- Juntunen, H., Tuominen, H., Viljaranta, J., Hirvonen, R., Toom, A., & Niemivirta, M. (2022). Feeling exhausted and isolated? The connections between university students' remote teaching and learning experiences, motivation, and psychological well-being during the COVID-19 pandemic. *Educational Psychology*, 42(10), 1241–1262. <https://doi.org/10.1080/01443410.2022.2135686>
- Karreinen, S., Rautiainen, P., Keskimäki, I., Satokangas, M., Viita-aho, M., & Tynkkynen, L.-K. (2023). Pandemic preparedness and response regulations in Finland: Experiences and implications for post-COVID-19 reforms. *Health Policy*, 132, 104802. <https://doi.org/10.1016/j.healthpol.2023.104802>
- Karwowski, W. (2005). Ergonomics and human factors: The paradigms for science, engineering, design, technology and management of human-compatible systems. *Ergonomics*, 48(5), 436–463. <https://doi.org/10.1080/00140130310001610892>
- Kausto, J., Airaksinen, J., Oksanen, T., Vahtera, J., Kivimäki, M., & Ervasti, J. (2024). COVID-19-induced changes in the workplace, psychosocial work environment and employee well-being: A longitudinal study. *Occupational Medicine*, 74(8), 571–580. <https://doi.org/10.1093/occmed/kqae079>

- Kähkönen, T. (2023). Remote work during the COVID-19 pandemic: Identification of working life impacts, employees' data protection abilities and trust outcomes. *Journal of Organizational Change Management*, 36(3), 450–467. <https://doi.org/10.1108/JOCM-06-2022-0179>
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). Sage.
- Kyrölähti, S., Neupane, S., Nygård, C. H., Oakman, J., Juutinen, S., & Mälikangas, A. (2022). Perceived work ability during enforced working from home due to the COVID-19 pandemic among Finnish higher educational staff. *International Journal of Environmental Research and Public Health*, 19(10), 6230. <https://doi.org/10.3390/ijerph19106230>
- Lavonen, J., & Salmela-Aro, K. (2022). Experiences of moving quickly to distance teaching and learning at all levels of education in Finland. In F. M. Reimers (Ed.), *Primary and secondary education during Covid-19* (pp. 105–123). Springer. https://doi.org/10.1007/978-3-030-81500-4_4
- Leal Filho, W., Wall, T., Salvia, A. L., Vasconcelos, C. R., Abubakar, I. R., Minhas, A., ... & Lombardi, P. (2025). The impacts of the COVID-19 lockdowns on the work of academic staff at higher education institutions: An international assessment. *Environment, Development and Sustainability*, 27(6), 13973–13999. <https://doi.org/10.1007/s10668-023-04026-z>
- Mayring, P. (2004). Qualitative content analysis. In U. Flick, E. von Kardorff, & I. Steinke (Eds.), *A companion to qualitative research* (pp. 159–176). Sage.
- McPhail, R., Chan, X. W., May, R., & Wilkinson, A. (2023). Post-COVID remote working and its impact on people, productivity, and the planet: An exploratory scoping review. *International Journal of Human Resource Management*, 35(1), 154–182. <https://doi.org/10.1080/09585192.2023.2221385>
- Myrsky, L., Kallunki, V., Katajavuori, N., Repo, S., Tuononen, T., Anttila, H., Kinnunen, P., Haarala-Muhonen, A., & Pyörälä, E. (2022). COVID-19 accelerating academic teachers' digital competence in distance teaching. *Frontiers in Education*, 7, 770094. <https://doi.org/10.3389/educ.2022.770094>
- Mäkelä, T., Sikström, P., Jääskelä, P., Korkala, S., Kotkajuuuri, J., Kaski, S., & Taalas, P. (2022). Factors constraining teachers' wellbeing and agency in a Finnish university: Lessons from the COVID-19 pandemic. *Education Sciences*, 12(10), 722. <https://doi.org/10.3390/educsci12100722>
- Mäkipää, T., Hildén, R., & Samulin, T. (2022). The perceptions of student teachers of online pedagogical courses and assessment practices in Finnish subject teacher education. *Education Sciences*, 12(6), 389. <https://doi.org/10.3390/educsci12060389>
- Nowrouzi-Kia, B., Haritos, A. M., Long, B. S., Atikian, C., Fiorini, L. A., Gohar, B., Howe, A., Li, Y., Bani-Fatemi, A. (2024). Remote work transition amidst COVID-19: Impacts on presenteeism, absenteeism, and worker well-being—A scoping review. *PLOS ONE*, 19(7), e0307087. <https://doi.org/10.1371/journal.pone.0307087>
- Ojala, S., & Pyöriä, P. (2013). Kotona työskentelyn yleisyys ja seuraukset: Suomi eurooppalaisessa vertailussa [The frequency and consequences of working from home: Finland in European comparison]. In P. Järvinen (Ed.), *Työpoliittinen aikakauskirja* (pp. 53–64). Työ- ja elinkeinoministeriö. <https://tem.fi/dmsportlet/document/2/411622>
- Oksanen, A., Oksa, R., Celuch, M., Cvetkovic, A., & Savolainen, I. (2023). COVID-19 anxiety and wellbeing at work in Finland during 2020–2022: A 5-wave longitudinal survey study. *International Journal of Environmental Research and Public Health*, 20(1), 680. <https://doi.org/10.3390/ijerph20010680>
- Okeke-Uzodike, O. E., & Ngo Henha, E. P. (2025). Resilience during crisis: COVID-19 and the new age of remote work in higher education—A systematic literature review. *Administrative Sciences*, 15(3), 92. <https://doi.org/10.3390/admsci15030092>
- Oulu University of Applied Sciences. (2021). *OUAS administration's Corona Task Force guidance for employees: Remote work practices* [Internal documentation].

- Oulu University of Applied Sciences. (2022). *OUAS Human Resources staff statistics in 2020 and 2021* [Internal documentation].
- Pappa, S., Yada, T., & Perälä-Littunen, S. (2020). International master's degree students' well-being at a Finnish university during COVID-19. *Open Education Studies*, 2(1), 240–251. <https://doi.org/10.1515/edu-2020-0128>
- Pianese, T., Errichiello, L., & Vieira da Cunha, J. (2022). Organizational control in the context of remote working: A synthesis of empirical findings and a research agenda. *European Management Review*, 20(3), 517–535. <https://doi.org/10.1111/emre.12515>
- QCAmap (2025). QCAmap // a software for Qualitative Content Analysis. <https://www.qcamap.org/ui/en/home>
- Ratti, L., & García-Muñoz, A. (2024). The regulation of remote work. Seeking balance through the articulation of labour law sources: A comparative appraisal. *International Journal of Comparative Labour Law and Industrial Relations*, 40(3), 323–348. <https://doi.org/10.54648/ijcl2024013>
- Reiman, A., & Väyrynen, S. (2018). Holistic well-being and sustainable organisations: A review and argumentative propositions. *International Journal of Sustainable Engineering*, 11(5), 321–329. <https://doi.org/10.1080/19397038.2018.1477783>
- Robertson, M. M., Schleifer, L. M., & Huang, Y. H. (2012). Examining the macroergonomics and safety factors among teleworkers: Development of a conceptual model. *Work*, 41(S1), 2611–2615. <https://doi.org/10.3233/WOR-2012-1029-2611>
- Ropponen, A. (2025). Remote work—the new normal needs more research. *Scandinavian Journal of Work, Environment & Health*, 51(2), 53. <https://doi.org/10.5271/sjweh.4213>
- Rosin, A. (2024). Cross-border telework and the applicable labour law: The role of different connecting factors in determining objectively applicable law. *European Labour Law Journal*, 15(4), 755–772. <https://doi.org/10.1177/20319525241251435>
- Sachs, J. D., Abdool Karim, S. S., Akin, L., Allen, J., Brosbøl, K., Colombo, F., Cuevas Barron, G., Espinosa, M. F., Gaspar, V., Gaviria, A., Haines, A., Hotez, P. J., Koundouri, P., Larraín Bascuñán, F., Lee, J.-K., Pate, M. A., Ramos, G., Reddy, K. S., Serageldin, I., ... Michie, S. (2022). The Lancet Commission on lessons for the future from the COVID-19 pandemic. *The Lancet*, 400(10359), 1224–1280. [https://doi.org/10.1016/S0140-6736\(22\)01585-9](https://doi.org/10.1016/S0140-6736(22)01585-9)
- Sarasjärvi, K. K., Vuolanto, P. H., Solin, P. C., Appelqvist-Schmidlechner, K. L., Tamminen, N. M., Elovainio, M., & Therman, S. (2022). Subjective mental well-being among higher education students in Finland during the first wave of COVID-19. *Scandinavian Journal of Public Health*, 50(6), 765–771. <https://doi.org/10.1177/14034948211021421>
- Schulte, P., & Vainio, H. (2010). Well-being at work—Overview and perspective. *Scandinavian Journal of Work, Environment & Health*, 36(5), 422–429. <https://doi.org/10.5271/sjweh.3075>
- Singh, P., Bala, H., Dey, B. L., & Filieri, R. (2022). Enforced remote working: The impact of digital platform-induced stress and remote working experience on technology exhaustion and subjective wellbeing. *Journal of Business Research*, 151, 269–286. <https://doi.org/10.1016/j.jbusres.2022.07.002>
- Soltaninejad, M., Babaei-Pouya, A., Poursadeqiyani, M., & Arefi, M. F. (2021). Ergonomics factors influencing school education during the COVID-19 pandemic: A literature review. *Work*, 68(1), 69–75. <https://doi.org/10.3233/WOR-203355>
- Statistics Finland. (2020). *Säännöllisesti kotona työskenteleminen on kaksinkertaistunut* [Regular work-at-home work has doubled]. <https://www.stat.fi/tietotrendit/blogit/2020/saannollisesti-kotona-tyoskenteleminen-on-kaksinkertaistunut/>
- Stavrova, O., Spiridonova, T., van de Valseyde, P., Meyers, C., & Evans, A. M. (2023). Does remote work erode trust in organizations? A within-person investigation in the COVID-19 context. *Social and Personality Psychology Compass*, 17(5), e12762. <https://doi.org/10.1111/spc3.12762>

- Sutela, H., Pärnänen, A., & Keyriläinen, M. (2019). *Digiajan työelämä – Työolotutkimuksen tuloksia 1977–2018* [Working life in the digital age – Results of the Working Conditions Survey 1977–2018]. Statistics Finland. https://www.stat.fi/tup/julkaisut/tiedostot/julkaisuluettelo/ytym_1977-2018_2019_21473_net.pdf
- Tapani, A., Sinkkonen, M., Sjöblom, K., Vangrieken, K., & Mäkikangas, A. (2022). Experiences of relatedness during enforced remote work among employees in higher education. *Challenges*, 13(2), 55. <https://doi.org/10.3390/challe13020055>
- Tiirinki, H., Tynkkynen, L. K., Sovala, M., Atkins, S., Koivusalo, M., Rautiainen, P., Jormanainen, V., & Keskimäki, I. (2020). COVID-19 pandemic in Finland—Preliminary analysis on health system response and economic consequences. *Health Policy and Technology*, 9(4), 649–662. <https://doi.org/10.1016/j.hlpt.2020.08.005>
- Trade Union of Education in Finland. (2020, April 14). *OAJ:n kysely: Yksittäisillä oppijoilla vaikeuksia, opetus sujuu etänä pääosin hyvin* [OAJ survey: Difficulties for individual learners, teaching is mostly going well remotely]. <https://www.oaj.fi/ajankohtaista/uutiset-ja-tiedotteet/2020/koronavirus-kysely/>
- Tulaskar, R., & Turunen, M. (2022). What do students want? Experiences, challenges, and engagement during emergency remote learning amidst the COVID-19 crisis. *Education and Information Technologies*, 27(1), 551–587. <https://doi.org/10.1007/s10639-021-10747-1>
- Uusiautti, S., Hyvärinen, S., & Björkman, S. (2024). The mystery of remote communality: University students' and teachers' perceptions during the COVID-19 pandemic. *Human Arenas*, 7, 232–249. <https://doi.org/10.1007/s42087-021-00262-7>
- Van Zyl, L. E., Cornelisse, M. A., Le Blanc, P., & Rothmann, S. (2025). Cracks in the JD-R model? The failure of strengths use, job crafting, and home-work spillover to support wellbeing during COVID-19. *Frontiers in Psychology*, 16, 1532083.
- Waldrep, C. E., Fritz, M., & Glass, J. (2024). Preferences for remote and hybrid work: Evidence from the COVID-19 pandemic. *Social Sciences*, 13(6), 303. <https://doi.org/10.3390/socsci13060303>
- Webropol. (2022). *An online survey tool that gets the answers that matter*. <https://www.webropol.co.uk/our-product/>
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage.