



This is a self-archived – parallel-published version of an original article. This version may differ from the original in pagination and typographic details. When using please cite the original.

LISENCE: Creative Commons, CC BY-NC-ND

AUTHOR Tagliaro Chiara, Migliore Alessandra, Danivska Vitalija, Poutanen Jenni, Pelsmakers Sofie, Kaasalainen Tapio, Nenonen Suvi

TITLE Home, university, and other spaces: Where finnish and italian academics did research prior to and during the covid-19 pandemic

YEAR 2022

DOI <http://dx.doi.org/10.4324%2F9781003181163-19>

VERSION OA, Publishers PDF

15 Home, university, and other spaces

Where Finnish and Italian academics
did research prior to and during the
COVID-19 pandemic

*Chiara Tagliaro, Alessandra Migliore,
Vitalija Danivska, Jenni Poutanen, Sofie Pelsmakers,
Tapio Kaasalainen, and Suvi Nenonen*

Academics' spatial challenges during the COVID-19 pandemic

Academics have a relative amount of job autonomy and can usually choose freely where and when to work. In the 1990s, Drucker (Forbes, 1997) predicted that university campuses would become relics since they would not survive the following thirty years due to the impact of information and communication technology (ICT). Has this prediction played out with the extensive work-from-home (WFH) experience of COVID-19? The lockdown period enforced in many countries around the world to counteract the spread of the virus led to the most extensive WFH experiment ever. Whereas WFH during the COVID-19 pandemic has been addressed in some studies (e.g. Felstead & Reuschke, 2020), a focus on academia is still missing. In the short term, all academic activities, including research and teaching, switched to a virtual mode, and universities were almost empty for several months. The potential long-term impacts of this change on the future of university work environments are still uncertain and deserve exploration.

Occupying an office on campus and using other campus spaces (e.g. informal areas, canteens, break areas) is critical to feeling recognized as a member of an intellectual community (Dowling & Mantai, 2017; Temple, 2009). Previous research confirms that disidentification occurs when working from home (Kuntz, 2012); while home may support solitary research, it hampers the sense of being a productive researcher. WFH requires an ability to juggle competing identities (e.g. parent, researcher, etc.) and the capacity of non-university spaces to support disciplined, focused, and productive research work. WFH also hinders informal interactions on campus which are often necessary for researchers' early career development and networking, replacing them with online conferences and meetings which limit face-to-face interaction.

The COVID-19 pandemic has accelerated the evolution of the traditional campus-based model of teaching and research (Orel & Bennis, 2020) towards a 'location-independent' work mode typical of knowledge work (Hernaes et al.,

2018). Campuses have changed from static geographical spaces to blurred places (Kuntz, 2012) spread across and integrated within the territory (Den Heijer, 2011). For example, hybrid environments for coworking and co-learning are increasing. Den Heijer (2020) describes the physical state of the campus as a combination of (i) fixed structures and (need for) territory on campus; (ii) multiple connections and shared spaces on campus; and (iii) the open structure of the campus and the possibility of working and studying anywhere. The third description has dominated during the pandemic. According to Ninnemann et al. (2020), there is a need for more ‘hybrid environments’ that combine traditional campuses with e-campuses and integrate formal and informal spaces to overcome disciplinary and organizational boundaries. Lahti and Nenonen (2021) state that co-designing the digital and physical work environment means co-designing the experience of presence and distance. A hybrid working environment requires not only the skills to use both digital and physical solutions for different functions and purposes, but also that users learn to identify their own needs.

Many opportunities for understanding the new needs of academics and imagining the future of research environments can be drawn from the experience of research work during COVID-19. This chapter discusses threats and opportunities for future physical research environments by analyzing academics’ work locations, workspaces, and work outcomes throughout the recent pandemic period. This study compares two different countries in Europe, Italy and Finland, which represent two contrasting situations for investigating research activities during the COVID-19 pandemic.

COVID-related regulations were significantly different in the two countries due to the different spread and trajectory of the pandemic over time. In Italy, restrictive regulations were lifted after 3 May 2020 and the degree of individual freedom to move around cities returned to normal during summer 2020, with campus facilities becoming accessible again. In Finland, only some restrictions were lifted in May 2020. Most universities advised their employees to continue working remotely when possible, in accordance with guidance from the Finnish Institute for Health and Welfare. In Italy, most universities invited their staff to repopulate campuses, whereas in Finland all research activities that did not require special physical settings (such as laboratories) and almost all teaching were conducted remotely for the whole of the 2020–2021 academic year.

These distinct policies might be explained with data from the OECD (2020), indicating that Finland was 9th of the 28 EU countries best adapted to remote working, with nearly 40% of jobs being compatible with remote work. Italy, on the other hand, ranked 21st with only 30% of jobs compatible with remote working. This misalignment between the two countries might also impact the number of active coworking spaces. For example, in Italy there were about 800 coworking spaces (CS) as of January 2021 (italiancoworking.it), which corresponds to about 1 CS for every 75,000 people, whereas in Finland there are an estimated 120 coworking spaces,¹ with about 1 CS every 45,000 inhabitants. Despite these differences, remote work has been growing and studied in both

countries. Italy and Finland appear among the most prolific countries for publications on coworking spaces (Berbegal-Mirabent, 2021). This study therefore explores (i) how the pandemic has affected the way academics use spaces for research, including working from home and third spaces such as coworking spaces, and (ii) if any differences emerge between the two countries.

Methods

Sample selection

This study focuses on a sample of academics from two Italian universities (Politecnico di Milano and Università di Bergamo, all campuses) and two Finnish universities (Aalto University, Otaniemi campus, and Tampere University). The four universities were chosen since they are located in similar geographical contexts and they share comparable socioeconomic structures. Milan and Bergamo, like Helsinki and Tampere, are close to each other but different in size. Milan and Helsinki are both the main business centres in their respective regions and are well connected to Bergamo and Tampere, which often house commuters to the main centres. This allowed us to evaluate the impact of COVID-19 not only on two different countries, but also between larger and smaller cities. The selected universities are home to multidisciplinary fields such as engineering, architecture, and social science, with the Politecnico di Milano and Aalto University located in larger cities. The Università di Bergamo and Tampere University are located in smaller urban areas. The four institutions cover a wide range of disciplines where academics generally are ‘free’ to choose their preferred work locations and lab-based research is more limited than, for example, institutions focused on life sciences with more lab-based work. With regard to campus layout and spatial features, both Italian universities feature a mix of historical and contemporary buildings distributed across multiple campuses in the city centre and peripheral locations (e.g. Dalmine for Università di Bergamo and Mantua for the Politecnico di Milano). The Finnish universities (Aalto University and Tampere University) were both established based on recent university mergers. Aalto University recently concentrated all their activities on one main campus, whereas Tampere University campuses are distributed across different locations within the city. Both universities are relatively young, and their building stock is characterized by both 1960s modernist and contemporary buildings.

Questionnaire design and administration

A survey was created by the Politecnico di Milano authors to investigate (i) usage frequency of different locations for research before and during the COVID-19 pandemic, considering ‘office’, ‘third space’, ‘home’, ‘collaborators’ premises’, ‘in transit’, and ‘other’ (items adapted from Kojo & Nenonen, 2015; Aroles et al., 2019; Burchell et al., 2020); (ii) university- and home-based

workspaces (items adapted from Bodin Danielsson & Bodin, 2008; Hua et al., 2010) and preferences towards the two spaces according to specific physical variables² (adapted from Appel-Meulenbroek et al., 2018); and (iii) satisfaction with work conditions and outcomes before and during the COVID-19 period (adapted from Appel-Meulenbroek et al., 2018).

The survey was administered in summer 2020 to all Italian academics ($n = 52,630$) thanks to public online lists, including all scholars tenured at public Italian universities but excluding PhD students, postdoctoral researchers, and research grant holders. The survey was distributed via email and remained open for voluntary confidential participation from 24 July to 24 September 2020. In a later phase, the same survey was translated and distributed among Finnish academics. Because Finland does not have the same open database of academics as Italy, the survey was shared with internal university communication teams, and then distributed via university newsletters and intranets between 15 February and 31 March 2021.

A total of 384 full, usable answers were obtained from the two Italian universities (population 1,832; response rate 21.0%), namely, the Politecnico di Milano (324) and the Università di Bergamo (60). Another 139 answers came from Finland (response rate approx. 2.6% of all academic staff, approx. 5,200), with 83 at Tampere University and 56 at Aalto University. Given the different countries and universities, not to mention sample size, direct comparisons were not always possible. Moreover, since the total number of responses (523) is not representative of all academic staff, the generalizability of results is limited. Nonetheless, this chapter still provides a valuable overview of the impacts of COVID-19 on academics.

Results and discussion

Sample characteristics

In both countries, the academics who responded belong mainly to engineering (70.3% in the Finnish sample; 84.6% in the Italian sample), followed by social sciences (18.1% in the Finnish sample; 15.1% in the Italian sample). Only a small number of respondents belong to the life sciences (11.6% in the Finnish sample; only one person in the Italian sample).

The sample shows differences in the two countries in terms of gender and age. In Italy, more women (225, 58.6%) than men (159, 41.4%) answered the questionnaire, while in Finland, slightly fewer women (60, 43.8%) responded than men (73, 53.2%), with a few unknowns. The Italian respondents were 48 years old on average, while Finnish respondents were 41 years old on average. This might be explained by the exclusion of more junior researchers in the Italian sample who were not publicly listed.

Prior to the COVID-19 pandemic, the Italian academics used to balance individual and collaborative research (individual work accounts for 51.6% of their overall time devoted to research, while collaborative work accounts for 48.4% of their time). The Finnish academics, however, were generally solo researchers (on average, 71.2% of their research time was spent individually and only 28.8% collaboratively).³ During the pandemic, the share of individual work increased by around 10% in both countries.

Table 15.1 Descriptive statistics about sample characteristics.

	<i>Finland</i>	<i>Italy</i>
<i>Number of respondents</i>	139	384
<i>Women</i>	60	225
<i>Men</i>	73	159
<i>Average age (years old)</i>	41	48
<i>Engineering sciences</i>	70.3%	84.6%
<i>Social sciences</i>	18.1%	15.1%
<i>Life sciences</i>	11.6%	1 person
<i>Individual work (% time)</i>	71.2%	51.6%
<i>Collaborative work (% time)</i>	28.8%	48.4%

Source: Authors.

The descriptive statistics are summarized in Table 15.1. As expected, these differences in types of work also emerged in different spatial practices.

Research at home, university, and ‘other spaces’ before and during the pandemic

This study analyzed which research locations the academics involved in the survey used prior to and during the COVID-19 pandemic for both individual and collaborative research activities.

Prior to the COVID-19 pandemic, individual and collaborative work in both countries was located mainly on campus. Most of the surveyed academics worked on campus at least once a week for individual work (95% Italian; 92.5% Finnish) and collaborative work (92.71% Italian; 88.4% Finnish). The second location by usage frequency was the home, which was used especially by the Italian academics, who seemed more used to working from home even for their collaborative work compared to the Finnish academics. On the one hand, 66.7% of the Italian academics and 69.9% of the Finnish academics performed individual work from home, with 23.2% of the Italian sample and only 5.2% of the Finnish sample performing teamwork from home. This is somewhat surprising, given the data from Eurofund regarding remote work, but it may depend on the fact that the Finnish researchers surveyed already collaborated less prior to COVID-19. However, a share of academics never worked from home prior to the pandemic, whether for individual (Italian 14.1%; Finnish 8.7%) or collaborative work (Italian 61.2%; Finnish 80.2%).

During the COVID-19 period, both Italian and Finnish academics moved their research primarily to the home. In Italy, 71.4% of researchers adopted WFH five or more times per week for individual work and 55.2% did so for collaborative work. In Finland, 89.1% of all respondents worked from home five or more times a week for individual work and 46.0% did so for collaborative work. It is worth noting that according to the open answers, Finnish academics also worked from their second homes (normally only used in summer for leisure).

The use of on-campus spaces decreased drastically. In Italy only 29.4% of the sample worked individually on campus at least once a week, while 30.5%

did so for collaborative work. In Finland, the university campus was still used at least once a week by 21.4% and 15.9% of respondents for individual work and teamwork, respectively. However, almost half the respondents never used the campus facilities for teamwork (52.9% Italian; 45.8% Finnish) or individual work (52.1% Italian; 42.9% Finnish). This result is an intuitive consequence of national and university policies during the COVID-19 period.

Other places were occasionally adopted for research both before and during the pandemic. Prior to COVID-19, 47.4% of the Italian sample and 59.2% of the Finnish sample used to collaborate from partners' premises (such as other universities or companies) but typically less than once a week. With regard to the use of third spaces (e.g. coworking spaces, cafés, etc.), the situation was quite different in the two countries. Just 15.9% of the Italian sample used third spaces for collaborative research, while 46.9% of the Finnish sample collaborated from third spaces, even if this occurred less than once a week. However, before the COVID-19 period more than 40% of Finnish academics and over 50% of Italian academics never worked from collaborators' offices or from third spaces, whether for individual or team work. This is also expected given the distinct concentration of coworking spaces in the two countries.

Also as expected, the occasional use of collaborators' facilities and third spaces dropped during the COVID-19 pandemic. Only a small group of academics in the two countries conducted collaborative research from collaborators' facilities (10.4% Italian; 10.0% Finnish) or third spaces (6.67% Italian; 14.1% Finnish), even if less than once a week.

While no particular differences emerged between the two Finnish universities, the Politecnico di Milano was more attractive for on-campus research than Bergamo both prior to and during the COVID-19 pandemic. Indeed, in Bergamo, WFH seemed to be a widespread practice before the pandemic: 31 of the 60 academics surveyed in Bergamo worked from home before COVID-19 for a considerable amount of time (more than 2 times per week). The same was not true for the Politecnico di Milano. During the COVID-19 pandemic, more of the academics surveyed (32.4%) worked on campus – especially for collaborative activities – compared to the scholars from Bergamo (20.0%). One reason for this may be the specific discipline-related activities, or the different perceived attractiveness of the campus facilities. However, Bergamo was one of the cities most affected by the COVID-19 pandemic (Wall Street Journal, 2020), which might have discouraged on-campus presence. In addition, further studies should be able to explain whether larger universities are more attractive in general, even in times of emergency (e.g. they offer more services, spaces, and research facilities).

University versus home environments

Beyond university recommendations and workers' fear of contagion, this study compared the home and campus environments to determine whether spatial factors influenced the chosen research location.

When on campus before COVID-19, 76.8% of the Italian academics and 59.7% of the Finnish academics worked from a shared office, ranging from

rarely to always; 58.9% of the Italian academics and 33.8% of the Finnish academics worked from a single office. This means that overall, the Italian academics were able to switch between multiple workstations on university premises. Moreover, in contrast to Italy, open-plan offices were frequently used at Finnish universities. Of the Finnish sample, 35.3% worked from open-plan offices and, specifically at Aalto University, open-plan offices were more used than private offices (44.6% versus 30.4%). However, after office spaces, meeting rooms were the most frequented spaces (Italy: 74.0%; Finland: 78.4%), confirming that prior to COVID-19, researchers used campus facilities for collaboration. This small difference might be explained by a larger use of open-plan spaces in Finland, where there is less access to private office space. In Italy, private office spaces are also used to host meetings. Moreover, 50.5% of the Italian sample and 33.8% of the Finnish academics also used labs for their research. This was especially the case for the Politecnico di Milano, for which the academics surveyed were mainly engineers.

During the COVID-19 period, social distancing norms increased the use of private spaces. When on campus, Italian academics occupied private office rooms at least rarely (32.8% of the Italian sample). In Finland this was less (19.4%), and private offices were subjected to the smallest decrease in use compared to other types of spaces. Meeting rooms, instead, showed the greatest decline in use (only 17.7% of the Italian sample and 21.6% of the Finnish occasionally accessed them), while labs showed a smaller decrease in use (25.8% of the Italian sample and 20.1% of the Finnish sample continued to use them to some extent during COVID-19). This again confirms that engineers may have needed labs for their research.

With regard to WFH, the use of home spaces is quite similar between the two countries. In both countries, the academics surveyed conducted their research mainly from their home offices (49.7% of respondents in Italy; 49.1% in Finland) or living rooms (70.8% of respondents in Italy; 77.7% in Finland). However, 50.3% of Italian and 50.9% of Finnish respondents stated they never used a home office (assuming they might not have had access to any). Just 29.2% of the Italian sample and 22.3% of the Finnish respondents said that they never used their living rooms. Differences emerged in Italy: academics at the Politecnico worked more from their living rooms than the academics from Bergamo (72.5% of Politecnico academics versus 61.7% of those from Bergamo). Moreover, in Italy, only 35.2% of the respondents said they worked from the bedroom. In contrast to the Italian sample, 56.1% of Finnish respondents stated they used their own bedrooms to work, with a higher proportion of those at Aalto University (69.6%). Other slight differences also existed between the two Finnish institutions, for example only 46.8% of respondents at Aalto University worked from a home office (compared to 50.7% in Tampere).

Differences among respondents from the four institutions do not appear to depend on house size, since dwellings were generally reported to be large in both Italian and both Finnish cities (more than 3 rooms on average). Further study is required to explain these differences. For example, the number of

people sharing the house and the inclination of the researchers to share the workspace with cohabitants are likely to influence these habits.

Beyond house spaces, specific physical features that made the house the preferred space for work were analyzed. Figure 15.1 shows respondents' spatial preferences between their home and the campus. Overall, most of the respondents found better break areas, exterior view, aesthetics, and privacy at home, while teamwork spaces, ICT facilities, ergonomics, and inspiration from the space were generally preferred on campus.

In Finland, campuses were reported to be much more comfortable than in Italy, especially related to more ergonomic facilities, better ICT facilities, and

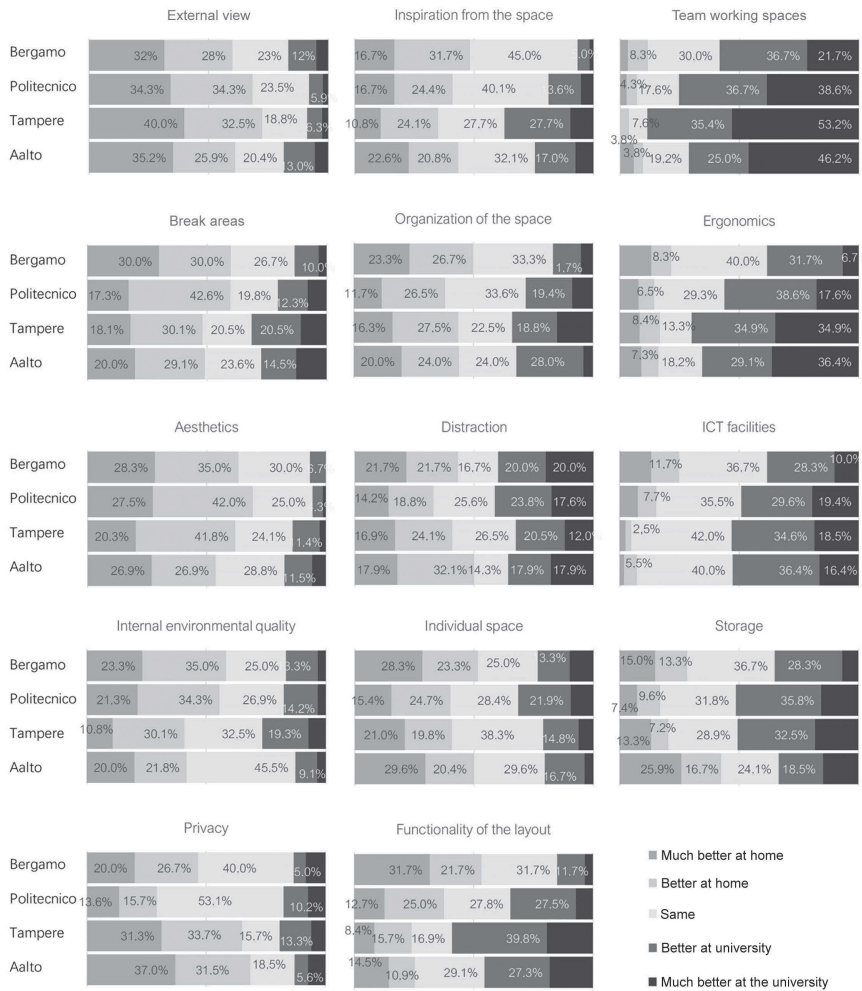


Figure 15.1 University versus home spatial features among the four surveyed universities.

Source: Authors.

functionality of the campus workspace (e.g. layout appropriateness). In Italy in contrast, especially in Bergamo, the academics stated that the workspace functionality was better at home than on campus, which might explain the preference for home working even prior to the COVID-19 pandemic. Among Finnish respondents, the premises at Tampere University appeared more comfortable than at Aalto University. This might be related to factors such as storage availability; whereas Tampere University provided adequate storage space, in Aalto, the scholars rated the availability of storage space better at home. The importance of storage space may be due to the prevalence of both shared and open-plan offices in Finland compared to the Italian universities. Conversely, the high rate of private offices in Italy intuitively favoured the fact that 51.2% respondents from the Politecnico di Milano rated better storage availability on campus than at home, while only 35.5% of academics in Bergamo did the same. This might be the reason why half of the Italian respondents rated individual space and privacy equally satisfactorily at campus and at home, while the Finnish respondents preferred their home environment.

However, when asked in an open-ended question (239 completed from the Italian sample; 145 blank; 114 completed from the Finnish sample; 25 blank) about future modifications of their homes to improve WFH, many Italian and Finnish academics extensively complained about the need for a single work room. This might be explained by the home and spaces being shared with other family members also working or being home-schooled during the pandemic.

Among the Italian samples, the Politecnico di Milano showed higher satisfaction rates than the Università di Bergamo for ergonomic comfort at work. These emerging differences might explain why academics in Bergamo worked from home more often than the respondents from Milan, even prior to COVID-19. Similarly, in Finland, the deficiency stated most often was the lack of a proper ergonomic workplace at home.

Outcomes on research and life

Figure 15.2 shows the respondents' work conditions and outcomes prior to and during the COVID-19 pandemic. With regard to 'availability of work time for research' and 'general working hours sufficiency', the sample is equally divided. However, differences emerged between the two countries. In Italy, the sample seems more impacted by new COVID-19 habits and fewer academics stated that their work time did not change compared to before. The same results emerged in relation to work-life balance, which was worse in general than before, but sufficiently better for a significant share of Italian and Finnish respondents. These results relate to the individual experience of each respondent. Some stated that their ability to take breaks – and possibly take care of their private life – was the same as before or even increased; others stated that it was worse or much worse than before. Further studies are necessary to justify this result, which likely depends on the specific family and private situation.

With regard to individual and collaborative productivity, both the Finnish and the Italian respondents reported that their productivity was worse or much



Figure 15.2 Respondents' work conditions and outcomes prior to and during the COVID-19 pandemic.

Source: Authors.

worse than prior to COVID-19, though some respondents also reported being more productive. This was also strongly reflected in the open responses. The main reasons identified for the lack of productivity were the additional time needed for remote teaching preparations and the lack of socialization with colleagues (e.g. not being able to exchange ideas with colleagues). Other factors also affecting productivity referred to the psychological discomfort caused by, for example, isolation and lack of a social environment and not being able to extend the workday because the workspace was shared with family members. Team productivity, especially in Finland, was considered even more affected than individual productivity during the pandemic, despite virtual environment tools (such as Teams, Zoom). Likewise, opportunities for socialization among colleagues were found to be much worse during COVID-19, especially for the Finnish respondents. This might indicate the importance of co-presence with colleagues.

Conclusions and future developments

This chapter contributed to the discussions about future research environments by analyzing work locations, work spaces, and work outcomes throughout the COVID-19 pandemic.

The study has several implications for the potential diversification of work locations for research. Despite the flexibility for scholars to decide where and when to work, a more flexible work style was only adopted in earnest during the COVID-19 period. The pandemic turned the focus to home as a real new workplace, including for academics. On the one hand, the home has the potential to provide the needed privacy and increased individual productivity, especially for academics working in shared or open-plan offices at the university, as highlighted by several respondents. On the other hand, the results also indicate that domestic privacy is enabled only/mainly if the employee is working alone at home. Otherwise, when family members are present, privacy is limited if there is a lack of a dedicated workspace at home. Although several respondents preferred their homes to other spaces, they still generally complained about their WFH conditions (especially in terms of ergonomic comfort and lack of appropriate ICT facilities and, in some cases, storage) and outcomes (e.g. socialization and team productivity). There is clearly a need for future studies to create a better understanding about the connection between home and work and the conditions for home working, including regional and national comparisons. While some open answers in this study captured the need for home modifications to enable WFH, actual knowledge on how hybrid work-living environments can best be designed is limited.

Furthermore, WFH issues might be mitigated through an increase in the use of third working spaces. If the freedom of knowledge workers has created an expansion of third spaces as workplaces, the academics surveyed still disregarded this option both before and during COVID-19 and worked mostly from home

instead. More research is necessary to understand the reasons why such spaces are still underused by academics (beyond COVID-19 safety reasons). Nevertheless, there might be room for coworking spaces, libraries, and other third spaces to host more research work once shared spaces are considered safe again. This perspective is especially relevant when considering that socialization and collaborative work, which are key to fruitful research activities, appear to have suffered the most from home-working. Therefore, spaces where community and social interactions are the core business, such as coworking spaces, are likely to gain further attention in the future. Moreover, these spaces can offer an array of services to support workers in neighbourhoods near their homes, including childcare and the provision of well-equipped facilities for those who do not have a dedicated space at home and find their campus spaces lacking key features to foster their productivity. Coworking spaces may offer cross-fertilization with other professionals, which supports the generation of ideas and business opportunities.

This study also highlights the need for university campuses to become more attractive. It has been said that work is not a place to go to but something one does, potentially anywhere. More research is required to explain why smaller cities (especially Bergamo in our sample) seemed to better accommodate more home workers than larger cities. In this study, no radical difference emerged between smaller and larger cities for any of the factors analyzed. In general, scholars seem to have gotten used to WFH by now and, given the freedom of choice and a ‘cabin fever’ effect, it might be challenging to re-establish strong academic communities and a sense of belonging on campus. Therefore, university spaces must offer something unique that academic staff cannot find anywhere else. For instance, the open layout of some university offices suggests a lack of private areas suitable for individual productivity (that homes might better enable). At the same time, open plan layouts foster collaborative productivity and socialization, which was found to be negatively affected during WFH. Perhaps a more flexible future of work may provide positive implications for work-life balance. Work is expected to permeate potentially every location of one’s life, yet the opportunity to have a dedicated and activity-based space for work in different locations may help in articulating more sustainable working hours.

Overall, the correct balance of collaborative and individual spaces will need to be created in university spaces, but the correct balance between on-campus and off-campus locations for work will also be increasingly important. Future developments for spaces for academic research might include their hybridization with other building types, for example mixed-use residential and commercial spaces.

Notes

- 1 An assumption from *coworker.com* data, which registers 44 CSs in Finland in May 2021 but usually records only a fourth to half of the existing spaces (proxy verified from other countries like Italy and Norway).

- 2 We considered the following 14 items: (i) internet connection quality; (ii) availability of space to take a break; (iii) availability of team working spaces (e.g. meetings/calls, etc.); (iv) ability to organize the space (e.g. personalization); (v) lack of distractions; (vi) privacy; (vii) availability of individual space; (viii) availability of storage for own items/work items; (ix) inspiration given by the environment (e.g. atmosphere, colours); (x) functionality of the workspace (layout); (xi) ergonomics of the workstation (e.g. desk); (xii) indoor environmental quality (e.g. temperature, air quality, light, etc.); (xiii) aesthetics; (xiv) outside view.
- 3 It is interesting to note that in the open answers, the respondents also clearly expressed the importance of co-presence for their solo research activities. While engaged in individual work, they seek the support of peers by occasionally exchanging ideas, for example.

References

- Appel-Meulenbroek, H.A.J.A., Clippard, M., & Pfnür, A. (2018) 'The effectiveness of physical office environments for employee outcomes: An interdisciplinary perspective of research efforts', *Journal of Corporate Real Estate*, 20(1), pp. 56–80.
- Aroles, J., Mitev, N., & De Vaujany, F.X. (2019) 'Mapping themes in the study of new work practices', *New Technology, Work and Employment*, 34(3), pp. 1–15.
- Berbegal-Mirabent, J. (2021) 'What do we know about co-working spaces? Trends and challenges ahead', *Sustainability*, 13(1416).
- Bodin Danielsson, C., & Bodin, L. (2008) 'Office type in relation to health, well-being, and job satisfaction among employees', *Environment and Behavior*, 40(5), 636–668. Available at: <https://doi.org/10.1177/0013916507307459>.
- Burchell, B., Reuschke, D., & Zhang, M. (2020) 'Spatial and temporal segmenting of urban workplaces: The gendering of multi-locational working', *Urban Studies*. Available at: <https://doi.org/10.1177/0042098020903248>.
- Den Heijer, A. (2011) *Managing the university campus: Information to support real estate decisions*. Delft: Eburon Academic Publishers.
- Den Heijer, A. (2020) *Campus of the future – managing a matter of solid, liquid and gas*. Delft: Architecture, Management in the Built Environment.
- Dowling, R., & Mantai, L. (2017) 'Placing researcher identifications: Labs, offices and homes in the PhD', *Area*, 49(2), pp. 200–207.
- Felstead, A., & Reuschke, D. (2020) *Homeworking in the UK: before and during the 2020 lockdown*. WISERD Report. Cardiff: Wales Institute of Social and Economic Research. Available at: <https://wiserd.ac.uk/publications/homeworking-ukand-during-2020-lockdown>.
- Forbes (1997) 'Seeing things as they really are', *Forbes Magazine*, 3 October. Available at: www.forbes.com/forbes/1997/0310/5905122a.html?sh=7c9ef14024b9 (accessed: 10 November 2020).
- Hernaus, T., Cerne, M., Connelly, C., Poloski Vokic, N., & Škerlavaj, M. (2018) 'Evasive knowledge hiding in academia: When competitive individuals are asked to collaborate', *Journal of Knowledge Management*, 23(4), pp. 597–618.
- Hua, Y., Lofness, V., Kraut, R., & Powell, K.M. (2010) 'Workplace collaborative space layout typology and occupant perception of collaboration environment', *Environment and Planning B: Planning and Design*, 37(3), 429–448. Available at: <https://doi.org/10.1068/b35011>
- Kojo, I.V.I., & Nenonen, S. (2015) 'Places for multi-locational work – opportunities for facilities management', *Facilities*, 33(1–2), pp. 20–37.
- Kuntz, A.M. (2012) 'Reconsidering the workplace: Faculty perceptions of their work and working environments', *Studies in Higher Education*, 37(7), pp. 769–782.

- Lahti, M., & Nenonen, S. (2021) 'Design science and co-designing of hybrid workplaces', *Buildings*, 11(3), p. 129.
- Ninnemann, K., Liedtke, B., Den Heijer, A., Gothe, K., Loidl-Reisch, C., Nenonen, S., Nestler, J., Tieva, Å., & Wallenborg, C. (2020) *Hybrid environments for universities*. Münster: Waxmann Verlag.
- OECD (2020) *Capacity for remote working can affect lockdown costs differently across places*. Available at: www.oecd.org/coronavirus/policy-responses/capacity-for-remote-working-can-affect-lockdown-costs-differently-across-places-0e85740e/#figure-d1e148 (accessed: 14 May 2020).
- Orel, M., & Bennis, W. (2020) 'The perspective of a coworking space model in scholarly settings', *On the Horizon*, 28(2), pp. 101–111.
- Temple, P. (2009) 'From space to place: University performance and its built environment', *Higher Education Policy*, 22, pp. 209–223.
- Wall Street Journal (2020) 'Bergamo, symbol of Italy's covid-19 tragedy in spring, fares better now', *Wall Street Journal*. Available at: www.wsj.com/articles/bergamo-symbol-of-italys-covid-19-tragedy-in-spring-fares-better-now-11604671200 (accessed: 14 May 2021).