Development and validation of the e-Work Self-Efficacy Scale to assess digital competencies in remote working

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ABSTRACT

The COVID-19 pandemic accelerated the adoption of remote working practices worldwide. This has focussed attention on the need to identify the competencies employers and employees should train and develop to build digital resilience, enabling the benefits of remote working to be realised while mitigating potential risks. This contribution presents a multifaceted e-Work Self-Efficacy Scale, which supports a recently developed Digital Resilience Competency Framework (DRCF), assessing e-skills, trust building, self-care, remote social skills, and remote emotional self-efficacy beliefs. Data from 670 non-managerial employees (54.0% males) from a tele-communications company based in the Czech Republic were analysed, providing support for a bi-factor model. Latent Profile Analysis identified three clusters, characterised by different profiles: the *Well-adjusted* (with a reasonably good balance in engagement, satisfaction, and productivity), the *Unhealthily dedicated* (suffering some difficulties in setting boundaries), and the *Distrustful self-shielding* (the most compromised) remote workers. The results reinforce the importance of focusing on digital resilience competencies to promote sustainable, productive, engaging and healthy remote working. The e-Work Self-Efficacy Scale is a practical and effective organisational tool for managers and employees to use to assess and build digital resilience and sits alongside the Digital Resilience Competency Framework.

1. Introduction

Remote working[2] practices have been consistently but slowly increasing over the last decade (Milasi, González-Vázquez, & Fernández-Macías, 2020). In Europe, it was estimated that the proportion of employees opting for home working, at least occasionally, increased from 5.4% to 9% between 2009 and 2019 (Milasi et al., 2020). The outburst of the COVID-19 pandemic in 2020 has been a catalyst for transforming working practices and accelerating the adoption of remote working. The proportion of employees affected by lockdown measures was estimated at 81% of the global workforce (ILO, 2020a). To tackle the COVID-19 pandemic the International Labour Organisation (ILO, 2020b) developed a four-pillar policy framework, of which the third pillar – 'Protecting workers in the workplace' – focused on the need for organisations to adopt working arrangements that ensured worker safety, prioritising home working wherever possible. Remote working suddenly became the norm, if not the only option, for many individuals, most of whom had marginal or no experience with this type of working (Eurofound, 2020; Milasi et al., 2020). While employees have generally perceived this new working experience as positive (Eurofound, 2020), it is not without problems. Unpreparedness and lack of experience was undoubtedly a source of struggle and challenge for many, but it cannot be identified as the only cause of difficulty elicited by the rapid and unforeseen shift to remote working practices (Milasi et al., 2020).

Remote working was already known to have benefits and drawbacks (see Allen, Golden, & Shockley, 2015; Charalampous, Grant, Tramontano, & Michailidis, 2019; Grant et al., 2013; Perry, Rubino, & Hunter, 2018). With many organisations signalling a permanent shift to remote and hybrid working (Eurofound, 2020; Milasi et al., 2020), there is an urgent need to understand and assess what needs to be put in place

to make the adoption of these new working arrangements sustainable, healthy, engaging and productive and ensure the workers retain a strong sense of belonging and connection to their organisations. Through developing specific competencies workers should be better placed to mitigate digital and remote working stressors and in turn more able to work from anywhere in a sustainable and healthy way without feeling a need to be 'always on' (Grant & Clarke, 2020). This addresses a central question facing employers and employees, notably how to embrace the benefits that remote working brings, whilst mitigating the potential risks (Grant & Clarke, 2020).

When analysing the changes produced by the technological revolution on working practices Gonzales Vazquez and colleagues (2019) indicated that technological change required new skills. They claimed that "new technologies affect tasks, not jobs. (…) digital technologies do not simply create and destroy jobs: they also change what people do on the job and how they do it" (p. 6). Further, they underlined the increasing relevance of both digital and non-cognitive skills to navigate effectively the technological revolution. The term 'digital skills' refers to the individual competencies required to use technology to learn and work (Gonzalez Vazquez et al., 2019; Vuorikari, Punie, Carretero, & Van den Brande, 2016). Non-cognitive skills refers to a broad range of soft competencies related to individual differences, as well as to emotional and social regulation (Gonzalez Vazquez et al., 2019). These non-cognitive soft skills are expected to become increasingly essential because they cannot be replaced by digital technology, and because they better enable employees' to deal with dynamic and unpredictable environments (Gonzalez Vazquez et al., 2019; Harari, 2018; World Economic Forum, 2018). Furthermore, through acquiring and developing resources (competencies) individuals become more resilient and able to bounce back (Grant & Clarke, 2020; Ten Brummelhuis & Bakker, 2012). Organisations and managers need to be able to monitor and assess their employees on both types of skills, ensuring that the support needed is provided, and tailored interventions can be put in place to enable benefits to be realised. To the best of our knowledge, there is no measure currently available in the literature providing a similar comprehensive assessment of remote working competencies.

The present contribution aims to fill this gap, by presenting the validation of a new multi-faceted e-Work Self-Efficacy Scale, rooted in the Digital Resilience Competency Framework (DRCF) recently developed by Grant & Clarke (2020), through a series of both quantitative and qualitative research studies conducted between 2017 and 2021. These studies demonstrated the need for a competency framework that could assist individuals, managers and their organisations positively manage remote working effectively, prioritising those competencies that promote employee wellbeing, productivity and engagement. The DRCF is consistent with previous seminal work on competences as defined in the management literature as knowledge, skills, attitudes and behaviours (Boyatzis, 2008), and is grounded in the self-determination theory (Ryan & Deci, 2000). It originally enlisted 21 competencies, which were contained within the following main competency categories: Knowledge; Personal efficiency; Trust; Self Care; and Social & Relational (Grant & Clarke, 2020). The newly developed measure presented in this contribution has been framed within these main competency categories resulting in 5 dimensions for scale development. This has been based on the premises that, when working remotely, employees need:

1) *E-skills* (Knowledge and Personal efficiency competencies), reflecting their capabilities to manage their workload and work tasks using digital technologies. This links to digital skills and the need to develop a good understanding of remote working practices, supporting digital tools (e.g., virtual conferencing) and their effective use. Remote working also requires individual self-management, organisation and prioritisation with individuals navigating challenges associated with self-motivation and working independently as well as navigating disruptions or distractions that may arise, whilst also avoiding procrastination that, in turn, might affect performance

and wellbeing (Grant, Wallace, & Spurgeon, 2013; Grant, Wallace, Spurgeon, Tramontano, & Charalampous, 2019; Wang, Liu, Qian, & Parker, 2021).

2) *Trust building skills* (Trust competency), reflecting their capabilities to build trustworthy relationships. Prior to the COVID-19 pandemic, remote working had been prevalently adopted by employees in senior, high-skilled positions or managerial roles (Eurofound and the International Labour Office, 2017; Gonzalez Vazquez et al., 2019; Milasi et al., 2020). Employees in roles that required higher levels of supervision had generally been considered less eligible for remote working (Milasi et al., 2020), possibly due to the reluctance of management to lose control or lose sight of what employees were working on (Kniffin et al., 2021). To overcome this challenge, remote workers need to develop and promote trust between the employee and the manager in order to benefit from the increased flexibility and autonomy that remote working can derive.

3) *Self-care skills* (Self Care competency), reflecting their capabilities to effectively and positively manage work-life boundaries that digital technologies provide though being able to access work at any time or from any place. While this has been praised as a great asset, promoting flexibility in the arrangement and organisation of one's own working time, it has also been a trigger for the 'always on' mindset with potential detrimental effects to mental health and wellbeing (e. g. Grant et al., 2019; Charalampous et al., 2019; Grant et al., 2013). Accessing remote working implies the capability to monitor and self-manage effectively the boundaries between personal and working life, as well as knowing when 'always on' becomes too much and what interventions can be applied to manage.

4) *Remote social skills* (Social & Relational Competency), reflecting their capabilities to manage and promote social relationships remotely. Isolation and lack of social exchange is a potential risk when working remotely (Charalampous et al., 2019; Eurofound, 2020; Kniffin et al., 2021). Furthermore, digital technology might result in increased complexity and interconnections of tasks and processes, requiring greater levels of collaboration and coordination amongst employees (Gonzalez Vazquez et al., 2019). Accessing remote working implies the capability to successfully initiate, promote, and sustain both formal and informal social interactions, knowing when remote or physical working will best aid productivity, belongingness and engagement.

Further to the original set of competencies included in the DRCF, and based on recommendations from the most recent literature and available data, an additional competency category was integrated:

5) *Remote emotional skills* (Emotional Competency) reflecting their capabilities to manage and act on their emotions when working remotely. Charalampous et al. (2019) underlined the potential impact of emotions on remote worker wellbeing. This was further confirmed by the results from a Eurofound (2020) survey conducted during the pandemic that highlighted that about 25% of employees perceived remote working to cause a high emotional demand. Accessing remote working implies the capability to manage emotions associated with the potential perception of loneliness and isolation (Charalampous et al., 2019; Kniffin et al., 2021; Wang et al., 2021), as well as with the guilt and anxiety possibly generated by the pressure of being constantly 'switched on'.

These elements were considered the five key theoretical dimensions to be covered in a measure aiming to provide a nuanced and comprehensive assessment of competencies for remote working. Based on the premise 'that people are inherently proactive and have a tendency towards growth and integrated functioning' (Grant & Clarke, 2020, p.123) and based on previous seminal contributions in the literature (Raghuram, Wiesenfeld, & Garud, 2003; Staple, Hulland, Higgins, 1999; Staples & Webster, 2007), a socio-cognitive perspective was taken to

operationalise these dimensions as self-efficacy beliefs, leading to the development of the e-Work Self-Efficacy Scale presented in the following section.

1.1. E-work self-efficacy scale: theoretical frame, development and analytical approach

Social cognitive theory focuses on human agency, and its principles and mechanisms, which 'enable people to play a part in their self-development, adaptation, and self-renewal with changing times' (Bandura, 2001, p.2). One of the essential features of human agency are self-efficacy beliefs defined as judgments of personal capability to manage one's own resources to define and execute actions needed to achieve desired results, and effectively deal with specific situations (Bandura, 1982, 1997, 2001). Self-efficacy affects individual performance and behavioural outcomes, both directly and indirectly, through its impact on motivation, perseverance, resilience and one's ability to cope (Bandura, 1982, 1997), as supported by recent meta-analyses across different realm of life(e.g. Aloe, Amo, & Shanahan, 2014; Chesnut & Burley, 2015; Klassen & Tze, 2014; Miao, Qian, & Ma, 2017; Sheeran et al., 2016; Shoji et al., 2016). Furthermore, "social cognitive theory lends itself readily to social applications because it specifies modifiable determinants" (Bandura, 2005, p.12), and it provides clear guidance on the most effective strategies and practices to promote and develop individual self-efficacy (e.g. Bandura, 1997). Previous research

has also suggested that social cognitive theory might be particularly suitable to examine remote working, because such working arrangements might result in more blurred procedures and practices and substantially relies on individual abilities, self-regulation and individual initiative to perform tasks under limited supervision. These results in employee self-efficacy being an essential dimension to monitor, promote, and develop (Raghuram et al., 2003; Staple et al., 1999). In the literature, it has been suggested that self-efficacy theory can be effectively integrated with self-determination theory (e.g. Sweet, Fortier, Strachan, & Blanchard, 2012), which provided the original framework for the development of the DRCF. Based on these premises operationalising the e-work competencies as self-efficacy beliefs were considered particularly effective and advantageous.

When developing the e-Work Self-Efficacy Scale, Bandura's recommendations were considered, according to which "self-efficacy scales must be tailored to activity domains and assess the multifaceted ways in which efficacy beliefs operate within a selected activity domain" (Bandura, 2006, p.310). Indeed, self-efficacy is domain-specific, since the same individual will not most likely perceive themselves as equally efficacious in all realms of life. Hence, when assessing self-efficacy, rather than referring to a generalised set of beliefs it is pivotal to frame clearly the measure within a specific domain, which in the present case is remote working. Existing measures used to assess self-efficacy in relation to remote working are generally unidimensional and focus specifically on technical and task-related aspects (e.g. Raghuram et al.,

Table 1
Item descriptive statistics and factor loadings for the 20- and 15-item e-Working Self-Efficacy Scale.

	When work remotely, how well can you …				20-item Factor Loadings		15-item Factor Loadings	
	e-skills Self-Efficacy	M	Sk	K	GF	SFs	GF	SFs
Item 1	*manage your tasks, even when you have not been explicitly told what it is expected of you?*	*4.35*	*−1.15*	*3.02*	*0.54*	*0.08*	*-*	*-*
Item 2	manage your time effectively, even if you have to juggle personal and professional commitments?	4.16	−0.93	1.19	0.63	0.21	0.64	0.19
Item 3	organise your activities, despite any distractions in your surroundings?	4.07	−0.83	1.05	0.68	0.72	0.68	0.73
Item 4	plan your activities effectively, despite disruptions you might have?	4.05	−0.76	0.80	0.68	0.56	0.67	0.56
	Trust building Self-Efficacy							
Item 5	complete your tasks, even with minimal supervision?	4.58	−1.36	3.02	0.58	0.55	0.57	0.56
Item 6	self-manage your time ensuring to complete your tasks on time and to a high standard?	4.51	−1.13	1.73	0.61	0.61	0.61	0.61
Item 7	constantly abide by organisational rules and policies, even when a shortcut could help you to complete your tasks more quickly?	4.43	−1.50	3.43	0.54	0.26	0.52	0.27
Item 8	*build trust and confidence with others even if you haven't met them in person previously?*	*4.04*	*−0.98*	*1.12*	*0.54*	*0.05*	*-*	*-*
	Self-care Self-Efficacy							
Item 9	understand when technology usage is impacting your wellbeing, even if you are very focussed on some work task?	3.79	−0.64	0.12	0.55	0.34	0.57	0.31
Item 10	take actions if you realise that being "always on" is becoming too much?	3.82	−0.70	0.11	0.60	0.60	0.64	0.56
Item 11	use different coping strategies to deal effectively with periods of high workload?	3.89	−0.85	0.71	0.70	0.42	0.72	0.37
Item 12	*adjust your work space to best suit the task you are working on?*	*4.15*	*−1.08*	*0.78*	*0.70*	*−0.01*	*-*	*-*
	Remote Social Self-Efficacy							
Item 13	*rely on a range of social support, if you need help with work and personal matters?*	*4.07*	*−1.00*	*0.70*	*0.68*	*0.05*	*-*	*-*
Item 14	use a range of different digital communication tools to quickly build rapport with others?	4.30	−1.24	1.82	0.64	0.53	0.59	0.58
Item 15	utilise a range of social networking tools to maximise your work relationships?	4.24	−1.27	1.90	0.59	0.62	0.55	0.65
Item 16	build networks (including virtually) with diverse groups of people?	3.56	−0.54	−0.52	0.60	0.37	0.56	0.42
	Remote Emotional Self-Efficacy							
Item 17	*avoid feeling lonely, if I do not have regular social contacts with your colleagues?*	*3.78*	*−0.74*	*−0.35*	*0.70*	*0.06*	*-*	*-*
Item 18	avoid feeling anxious if you receive work notification outside the working hours?	3.92	−0.85	−0.05	0.71	0.25	0.70	0.24
Item 19	manage your working hours as you prefer, without feeling guilty for not being online when your other colleagues are?	3.81	−0.79	−0.20	0.61	0.66	0.64	0.64
Item 20	not worry that your colleagues will doubt you are actually working?	4.11	−1.08	0.70	0.47	0.48	0.49	0.46

Note. M = Mean. Sk = Skewness. K=Kurtosis. GF = General Factor. SFs = Specific Factors. Item in italics were eliminated from the scale in following analyses.

2003; Staples, Hulland, & Higgins, 1999, 2007). However, as per Bandura's recommendations, within the domain under study, a range of diverse facets need to be captured to disentangle an individual's experience. For the development of the e-Work Self-Efficacy Scale, five key theoretical dimensions previously identified are referred to. In particular, the original set of 20 items presented in Table 1 has been developed, consisting of four items for each theoretically posited facets. Hence, the original measure included e-skills self-efficacy, trust building self-efficacy, self-care self-efficacy, remote social self-efficacy, and remote emotional self-efficacy.

1.2. Plan of analyses

In line with recent contributions examining the factorial structure of multifaceted self-efficacy measures in organisational and educational settings (Barbaranelli, Fida, Paciello, & Tramontano, 2018; Cornick, 2015; Török, Tóth-Király, Bőthe, & Orosz, 2017; van Dinther, Dochy, Segers, & Braeken, 2013), a bifactor model was tested against three alternative models: 1) single factor (i.e., all items loading on a unique factors); 2) five first-order factors (i.e., subset of items loading on the corresponding theoretical factors, which are correlated to each other); 3) second-order factors (i.e., subset of items loading on the corresponding theoretical factors, which were then loaded onto a hierarchically higher factor). Bifactor models are particularly suitable for multifaceted constructs, where it is possible to hypothesise a *general factor* - accounting for the commonality shared by all the items - along with multiple *specific factors* - each one accounting for their unique influence on corresponding sub-set of items, above and beyond the general factor (Brunner, Nagy, & Wilhelm, 2012; Chen, Hayes, Carver, Laurenceau, & Zhang, 2012; Chen, West, & Sousa, 2006). In this case, the hypothesis was that the general factor would have captured the domain specificity, while the specific factors would have captured the posited facets.

Goodness of fit was assessed considering: Chi^2 (expected to be not significant, however being sensitive to sample size, is generally considered in combination with other indices); CFI (with values greater than 0.90 considered good, and greater than 0.95 excellent); RMSEA (with values lower than 0.08 considered good, and lower than 0.06 excellent, along with a no significant test of close fit); SRMR (with value lower than 0.08 considered good). In addition, the following comparative indices were also reported: Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), and sample size Adjusted Bayesian Information Criteria (ABIC) (the model with the lowest AIC/BIC/ABIC is considered the best).

Once confirmed the factorial structure, a Latent Profile Analysis was completed to explore whether it was possible to identify clusters of employees characterised by different profiles in the general and specific factors. The number of clusters to retain was established considering: a) AIC, BIC, ABIC comparative indices (the lower the score the better); b) Lo-Mendel-Rubin Adjusted Likelihood Ratio Test for *n-1* versus *n* clusters solution (not significant test indicating that the n cluster solution does not result in a statistically improved fit, hence the n-1 clusters solution can be retained); c) the interpretability of the solution.

Finally, to support the validity of the newly developed measure, a set of Univariate ANOVAs and Chi2 tests were completed to check whether and to what extent the identified clusters were significantly associated with socio-demographic characteristics and additional psychosocial measures.

2. Method

2.1. Sample and procedure

Data was collected from a multi-national telecommunications company based in the Czech Republic (henceforth referred to as "the Organisation"). The organisation comprised of sales (field and retail)

teams, customer care, technology and support functions. The first case of COVID-19 in the Czech Republic was reported 1st March 2020 (https://www.statista.com/statistics/1104327/czechia-coronavirus-covid-19-new-cases/). This was followed by the Czech government declaring a state of emergency on 13 March 2020 (https://www.mvcr.cz/mvcren/article/state-of-emergency.aspx). Following government guidance, all of the Organisations eligible employees adopted remote working practices as of 13th March 2020 and have largely continued to operate in this mode. Prior to the pandemic, around 25% of the Organisations employees regularly worked remotely, this increased to 87% at the peak of the pandemic in 2020. Retail teams continued to trade in stores throughout the pandemic and were not eligible for remote working.

After receiving Ethical Clearance from the University to which two of the authors are affiliated and the Organisation, a quantitative survey was constructed. Data was collected between 1st and 14th December 2020 using a multichannel communication approach. This included; a direct email to all employees, manager cascade through team meetings, promotion through a weekly manager/employee newsletter and promotion through a bi-weekly senior management video broadcast to employees. Promotion of the survey included a link to the information sheet and consent form. In total, the survey was disseminated to 2456 employees. One-thousand and one responses were received (response rate = 40.7%), however 34 respondents claimed not to work remotely, and 124 provided very limited (if any) information. The final sample comprised 843 respondents, out of whom 154 (18.3%) had managerial responsibilities and 670 (79.5%) did not, with the remainder 19 (2.3%) preferring not to say. The present contribution is based on responses from employees with no managerial responsibilities. The sample comprised 362 males (54.0%), 299 females (44.6%), and 9 (1.3%) respondents who identified as other or prefer not to say. Forty-one (6.1%) were between 18 and 24 years old, 223 (33.3%) between 25 and 34, 263 (39.3%) between 35 and 44, 102 (15.2%) between 45 and 54, 28 (4.1%) were over 55, and 13 (1.9%) preferred not to say. Sample characteristics align with the organisations demographics. Two-hundred and sixty (38.8%) reported having caring responsibilities while working from home (e.g. childcare, eldercare, looking after an ill or disabled person), with 40 respondents (6.0%) preferring not to say. In terms of experience with working remotely, at least to some extent, 294 (43.9%) indicated they had prior experience of one year or less, 238 (35.5%) between 2 and 5 years, and 138 (20.6%) 6 years or more. Participants were asked how frequently they checked or completed work tasks outside of office hours; 57 (8.5%) indicated 'constantly', 202 (30.1) 'frequently', 336 (50.1%) 'sometimes', 61 (9.1%) never, while 14 (2.1) preferred not to say. When asked what percentage of their working hours they would ideally like to work remotely in the future, 27 respondents (4.0%) indicated up to 25%, 116 (17.3%) up to 50%, 199 (29.7%) up to 70%, 324 (48.4%) up to 100%, with 4 respondents (0.6%) not providing an answer.

2.2. Measures

E-Work Self-Efficacy. The 20-item version of the newly developed measure presented in the introduction was administered. Participants were required to rate how well they could perform against what was described in the items on a 5-point Likert scale, ranging from 1 (=Not at all) to 5 (=Completely). Information about the factorial structure and the reliability is presented in the Results section.

E-work Life Scale. A revised 19-item version of the scale developed by Grant et al. (2019) was administered. Respondents were required to report on a scale from 1 (=Strongly Disagree) to 5 (=Strongly Agree) their level of agreement with statements that assessed the quality of their e-work life. In particular, the following dimensions were assessed: Organisational Trust (5 items, e.g. "When I'm not visible e-working remotely, my manager trusts me to work effectively"), Flexibility (4 items, "My work is so flexible I could easily take time off e-working remotely, when I want to"), Work-Life Balance (5 items, e.g. "I am happy

with my work life balance when e-working remotely), and Effectiveness/Productivity (5 items; e.g. "My overall job productivity has increased by my ability to e-work remotely"). The Confirmatory Factor Analysis resulted in a very good fit: Chi^2 (143) = 383.751, p = .000; RMSEA = 0.050, C.I. = 0.044 - 0.056, p = .476; CFI = 0.941; SRMR = 0.068. Factor Determinacies scores were 0.86 for Organisational Trust, 0.94 for Flexibility, 0.94 for Work-Life Balance, and 0.93 for Effectiveness/Productivity.

Individual and Team Resilience (Stephens, Heaphy, Carmeli, Spreitzer, & Dutton, 2013) was assessed by 5 and 3 items respectively (e. g. Individual: "I see challenges as an opportunity to learn"; Team: "My team is able to cope with difficult periods of time"). Respondents were asked to rate on a scale from 1 (=Strongly Disagree) to 5 (=Strongly Agree), their agreement to a set of statements related to their own and their team resilience. The Confirmatory Factor Analysis resulted in an excellent fit: Chi^2(19) = 22.141, p = .277; RMSEA = 0.016, C.I. = 0.000 - 0.040, p = .994; CFI = 0.997; SRMR = 0.020. Factor Determinacies scores were 0.89 for Individual Resilience, and 0.97 for Team Resilience.

Engagement and Belongingness were assessed by three items each (e.g. Engagement: "I would recommend the organisation as a great place to work"; Belongingness: "I feel a strong sense of belonging to the organisation) used by the Organisation for internal monitoring purposes. The Confirmatory Factor Analysis resulted in a good fit: Chi^2(7) = 30.887, p = .000; RMSEA = 0.075, C.I. = 0.049 - 0.103, p = .055; CFI = 0.974; SRMR = 0.030. Factor Determinacies scores were 0.92 for both Engagement and Belongingness.

Technostress was assessed by 12 items adapted by the measure developed by Ragu-Nathan and colleagues (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008). In particular, respondents were required to rate on a scale from 1 (=Strongly Disagree) to 5 (=Strongly Agree), their level of agreement with statements assessing: Techno Overload (4 items; e.g. "I am forced by e-working to work much faster"), Techno Complexity (4 items; e.g. "I do not find enough time to upgrade my technology skills"), and Techno insecurity (4 items; e.g. "I have to constantly update my skills to avoid being replaced"). The Confirmatory Factor Analysis resulted in a very good fit: Chi^2(50) = 125.202, p = .000; RMSEA = 0.050, C.I. = 0.039 - 0.061, p = .475; CFI = 0.967; SRMR = 0.040. Factor Determinacies scores were 0.93 for Techno Overload, 0.93 for Techno Complexity, 0.92 for Techno Insecurity.

Work satisfaction was assessed by 5 items purposely developed for the present study, asking participants to rate their level of satisfaction with their work, their relationship with the colleagues, their relationship with the manager, the support received by the organisation, their work-life balance. The Confirmatory Factor Analysis resulted in an excellent fit: Chi^2(5) = 19.087, p = .002; RMSEA = 0.069, C.I. = 0.038 - 0.103, p = .145; CFI = 0.963; SRMR = 0.034. Factor Determinacies score was 0.89.

3. Results

Descriptive Statistics for the e-Work Self-Efficacy Scale are reported in Table 1. Since a few items presented values and kurtosis greater than | 1|, suggesting a non-normal distribution, the Confirmatory Factor Analyses was implemented using maximum likelihood with robust standard errors (MLR) estimator.

The bifactor model resulted in a very good fit: Chi^2(150) = 367.775, p = .000; RMSEA = 0.048, C.I. = 0.042 - 0.054, p = .689; CFI = 0.950; SRMR = 0.042. Alternative models were tested, in particular: a single factor model, a 5-factor model, and a second order factor, which all resulted in an inadequate fit (see Table 2). All the loadings on the General Factor were significant. As per the specific factors, loadings were all significant but for item 1(E-skill, p = .156); item 8 (e-trust, p = .388); item 12 (self-care, p = .852); item 13 (social = 0.394); and item 17 (emotional, p = .274). These five items were problematic also in the alternative models, being associated with high modification indices suggesting cross-loadings or correlation between residuals.

Analyses were then replicated after eliminating these items. The 15-item version of the scale resulted in a better fit: Chi^2(75) = 3148.108, p = .000; RMSEA = 0.039, C.I. = 0.030 - 0.049, p = .971; CFI = 0.971; SRMR = 0.034. In this case the alternative models resulted in an inadequate fit, with the only exception of the model positing a second order factor that had a good fit, although consistently worse than the bifactor model. The fit improvement was further supported by the substantial reduction of all the comparative indices, with the Akaike Information Criterion (AIC) decreasing from 25,006.475 to 18,291.749; the Bayesian Information Criterion (BI) decreasing from 25,362.005 to 18,558.397; Sample-Size Adjusted BIC decreasing from 25,108.015 to 18,367.904. In addition, the second-order model and the bifactor model were also compared using the Satorra Bentler scaled Chi2 test, which resulted significant (Chi$^2_{diff}$ = 58.13, df$_{diff}$ = 10, p<.000), further supporting the decision to retain the bifactor model. All the loadings on the general and the specific factors were significant (see Table 1). Factor determinacies scores were 0.92 for the general factor, 0.93 for e-skills, 0.79 for trust building, 0.72 for self-care, 0.82 for remote social, and 0.80 for remote emotional.

Factor scores from the bifactor model were saved in Mplus and used to implement the Latent Profile Analyses. However, prior to this, data was checked to identify and remove multivariate outliers using Mahalanobis distance, resulting in the exclusion of 13 respondents from subsequent analyses. Models with increasing number of classes, from 1 to 6, were implemented and results are summarised in Table 3.

The AIC, BIC, and ABIC consistently decrease with the increase of the number of clusters, however the Lo-Mendel-Rubin adjusted LRT resulted not significant moving from a 3-cluster to a 4-cluster solution. Hence, although the entropy level was slightly higher for the 4-cluster solution, we opted for the more parsimonious 3-cluster solutions. The

Table 2
Fit indices of the alternative models for the 20-item and 15-item e-Working Self-Efficacy Scale.

	20-item scale										
	AIC	BIC	ABIC	Chi2	df	p	RMSEA	CI	p	CFI	SRMR
Single Factor	26299.944	26566.592	26376.099	1285.520	170	0.000	0.102	0.097–0.107	0.000	0.741	0.07
First Order Factors	26703.651	26970.299	26779.806	1613.035	170	0.000	0.116	0.111–0.121	0.000	0.665	0.322
Second Order Factor	25398.344	25687.213	25480.846	666.637	165	0.000	0.070	0.064–0.075	0.000	0.884	0.866
Bifactor	25006.475	25362.005	25108.015	367.775	150	0.000	0.048	0.042–0.054	0.689	0.95	0.042
	15-item scale										
	AIC	BIC	ABIC	Chi2	df	p	RMSEA	CI	p	CFI	SRMR
Single Factor	19586.558	19786.544	19643.674	1064.138	90	0.000	0.131	0.124–0.138	0.000	0.695	0.081
First Order Factors	19414.589	19614.575	19471.705	992.299	90	0.000	0.126	0.119–0.133	0.000	0.717	0.308
Second Order Factor	18403.477	18625.683	18466.939	241.388	85	0.000	0.054	0.046–0.062	0.193	0.951	0.055
Bifactor	18291.749	18558.397	18367.904	148.108	75	0.000	0.039	0.030–0.049	0.971	0.977	0.034

Note. AIC = Akaike Information Criteria. BIC=Bayesian Information Criteria. ABIC = Sample-size adjusted Bayesian Information Criteria. df = degrees of freedom. RMSEA = Root Mean Square Error of Approximation. CI=Confidence Interval CFI=Comparative Fit Index. SRMR=Standardised Root Mean Square Residual.

Table 3
Results from Latent Profile Analyses (1–6 classes).

	AIC	BIC	ABIC	Entropy	LMR Adj LRT	p
1 cluster	8733.76	8786.82	8748.73			
2 clusters	8541.79	8625.80	8565.48	0.90	201.49	0.00
3 clusters	8389.97	8504.93	8422.39	0.83	162.21	0.00
4 clusters	8292.02	8437.93	8333.16	0.86	109.52	0.10
5 clusters	8203.57	8380.43	8253.44	0.88	100.22	0.34
6 clusters	8118.88	8326.69	8177.48	0.89	96.55	0.49

Note. AIC = Akaike Information Criteria. BIC=Bayesian Information Criteria. ABIC = Sample-size adjusted Bayesian Information Criteria. LMR Adj LRT = Lo-Mendel-Rubin Adjusted Likelihood Ratio Test for n-1 versus n clusters.

corresponding cluster are represented in Fig. 1, in which factor scores were previously standardised, easing the visualisation of the findings.

A set of Univariate ANOVAs were implemented to test differences across the classes in the e-working Self-Efficacy factors. Results highlighted the following differences:

a. *General e-Work Factor.* Cluster 1 and 2 were significantly lower than Cluster 3 ($F_{2,612} = 181.491$, p = .000; $\eta^2 = 0.372$).
b. *e-Skills Self-Efficacy.* Cluster 1 and 3 were significantly lower than Cluster 2 ($F_{2,612} = 10.496$, p = .000; $\eta^2 = 0.033$).
c. *Trust Building Self-Efficacy.* The three clusters significantly differ from each other ($F_{2,612} = 533.201$, p = .000; $\eta^2 = 0.635$), with Cluster 1 being the lowest, Cluster 3 being intermediate, and Cluster 2 the highest.
d. *Self-care Self-Efficacy.* The three clusters significantly differ from each other ($F_{2,612} = 332.566$, p = .000; $\eta^2 = 0.521$), with Cluster 2 being the lowest, Cluster 3 being intermediate, and Cluster 1 the highest.
e. *Remote Social Self-Efficacy.* The three clusters significantly differ from each other ($F_{2,612} = 20.189$, p = .000; $\eta^2 = 0.062$), with Cluster 1 being the lowest, Cluster 3 being intermediate, and Cluster 2 the highest.
f. *Remote Emotional Self-Efficacy.* Cluster 2 is significantly lower than Cluster 1 and 3 ($F_{2,612} = 9.731$, p = .000; $\eta^2 = 0.031$).

An additional set of Univariate ANOVAs were implemented to test

the differences across the classes in the E-Work Life Scale, Individual and Team Resilience, Engagement and Belongingness, Technostress, and Work Satisfaction. Results are described further below and summarised in Table 4:

a. E-Work Life *Scale.* Cluster 1 is significantly lower than Cluster 2 and Cluster 3 ($F_{2,612} = 20.766$, p = .000; $\eta^2 = 0.064$) in Organisational Trust. The three Clusters significantly differ from each other in Work-Life Balance ($F_{2,611} = 39.240$, p = .000; $\eta^2 = 0.114$), with Cluster 2 being the lowest, Cluster 1 the intermediate, and Cluster 3 the highest. Cluster 3 is significantly higher than Cluster 1 and Cluster 2 in Effectiveness/Productivity ($F_{2,606} = 35.780$, p = .000; $\eta^2 = 0.106$). No significant differences emerged for the Flexibility ($F_{2,612} = 2.744$, p = .065; $\eta^2 = 0.009$).
b. *Individual and Team Resilience.* Cluster 3 is significantly higher than Cluster 1 and Cluster 2 both in Individual ($F_{2,608} = 34.107$, p = .000; $\eta^2 = 0.101$) and Team ($F_{2,606} = 26.934$, p = .000; $\eta^2 = 0.082$) Resilience.
c. *Engagement and Belongingness.* Cluster 3 is significantly higher than Cluster 1 and Cluster 2 in Engagement ($F_{2,588} = 30.444$, p = .000; $\eta^2 = 0.094$). The three clusters significantly differ from each other in Belongingness ($F_{2,611} = 38.330$, p = .000; $\eta^2 = 0.115$), with Cluster 1 being the lowest, Cluster 2 the intermediate, and Cluster 3 the highest.
d. *Technostress.* Cluster 1 is significantly higher than Cluster 2 and Cluster 3 both in Techno Complexity ($F_{2,579} = 12.628$, p = .000; $\eta^2 = 0.042$) and in Techno Insecurity ($F_{2,579} = 13.918$, p = .000; $\eta^2 = 0.046$). There are no significant differences across the Clusters in Techno Overload ($F_{2,579} = 2.041$, p = .131; $\eta^2 = 0.007$).
e. *Work satisfaction.* Cluster 3 is significantly higher than Cluster 1 and Cluster 2 ($F_{2,577} = 50.941$, p = .000; $\eta^2 = 0.150$).

A set of Chi^2 tests were also implemented to check whether further characteristics of the sample were associated with the 3 clusters. There was no significant association with gender [Chi^2(2) = 0.234, p = .890], or those with caring responsibilities [Chi^2(2) = 3.582, p = .167]. Clusters membership was significantly associated with:
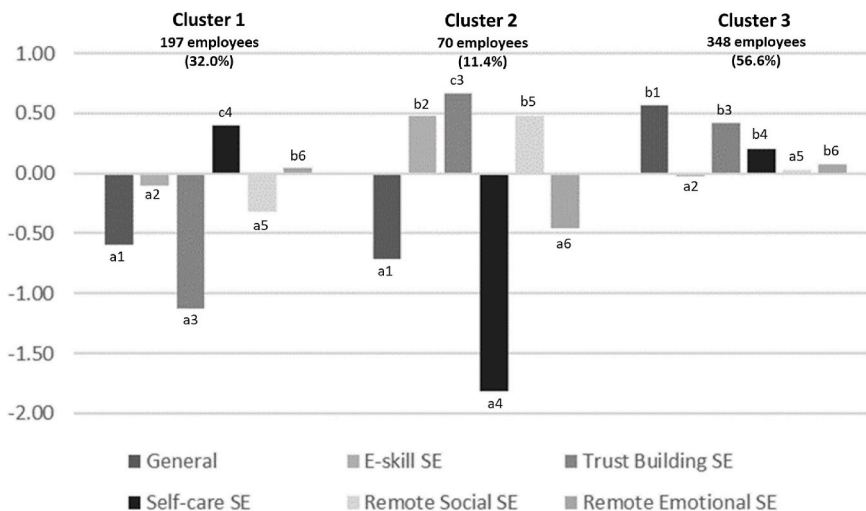
Fig. 1. 3-Cluster solution of the Latent Profile Analysis.
Note. General = General Factor. *Specific Factors:* SE=Self-Efficacy. Bars are numbered according to the corresponding factor: 1 = General Factor; 2 = E-skill SE; 3 = Trust Building SE; 4 = Self-Care SE; 5 = Remote Social SE; 6 = Remote Emotional SE. The associated letters refer to statistical differences across the clusters per each factor. In particular, different letters indicate statistically significant differences.

Note. General=General Factor. *Specific Factors:* SE=Self-Efficacy. Bars are numbered according to the corresponding factor: 1=General Factor; 2=E-skill SE; 3=Trust Building SE; 4=Self-Care SE; 5=Remote Social SE; 6=Remote Emotional SE. The associated letters refer to statistical differences across the clusters per each factor. In particular, different letters indicate statistically significant differences.

Table 4
Differences across the 3 clusters.

		Cluster 1	Cluster 2	Cluster 3	F	p	η^2
E-work Life	Organisational Trust	4.32(a)	4.52(b)	4.62(b)	$F_{2,612} = 20.766$	0.000	0.064
	Flexibility	3.75	3.96	3.95	$F_{2,612} = 2.744$	0.065	0.009
	Work-Life Balance	3.45(b)	3.12(a)	3.98(c)	$F_{2,611} = 39.240$	0.000	0.114
	Effectiveness/Productivity	3.60(a)	3.76(a)	4.20(b)	$F_{2,606} = 35.780$	0.000	0.106
Resilience	Individual	4.08(a)	4.23(a)	4.46(b)	$F_{2,608} = 34.107$	0.000	0.101
	Team	4.39(a)	4.40(a)	4.74(b)	$F_{2,606} = 26.934$	0.000	0.082
Engagement		3.63(a)	3.87(a)	4.21(b)	$F_{2,588} = 30.444$	0.000	0.094
Belongingness		4.00(a)	4.24(b)	4.51(c)	$F_{2,611} = 38.330$	0.000	0.115
Technostress	Techno Overload	2.90	3.12	2.84	$F_{2,579} = 2.041$	0.131	0.007
	Techno Insecurity	2.32(b)	1.94(a)	1.93(a)	$F_{2,579} = 13.918$	0.000	0.042
	Techno Complexity	2.22(b)	1.90(a)	1.80(a)	$F_{2,579} = 12.628$	0.000	0.046
Work Satisfaction		7.96(a)	7.97(a)	8.94(b)	$F_{2,577} = 50.941$	0.000	0.150

Note. Different letters indicate statistically significant differences.

- Previous experience e-working [Chi^2(4) = 16.850, p = .002], with individuals having one year or less experience being more likely to be in Cluster 1 (standardised residual = 2.1), and individuals with 6 years or more less likely to be in Cluster 1 (standardised residual = −2.4).
- Age [Chi^2(8) = 21.072, p = .007], with individuals between 18 and 24 years of age more likely to be in Cluster 1 (standardised residual = 2.3).
- Checking work outside office hours [Chi^2(6) = 15.593, p = .016], with individuals constantly doing it being less likely to be in Cluster 1 (standardised residual = 1.9) and more likely to be in Cluster 2 (standardised residual = 2.2).
- Ideal proportion of e-working in the future [Chi^2(6) = 44.127, p = .000], with individuals indicating up to 25% more likely to be in Cluster 1 (standardised residual = 3.8), and less likely to be in Cluster 3 (standardised residual = −2.5); individuals indicating up to 50% less likely to be in Cluster 3 (standardised residual = −1.9); individuals indicating up to 100% more likely to be in Cluster 3 (standardised residual = 2.2) and less likely to be in Cluster 1 (standardised residual = −1.9).

4. Discussion

Over the last decade organisations have gradually moved towards greater flexibility for workers, with increased accessibility to remote technologies including the ability to work from home. While the up-take of working from home has increased, the COVID-19 pandemic has accelerated this trend, in part due to the increased safety measures put in place. For many, this has led to a significant adjustment and a *democratisation* of who can work remotely. While remote working used to be an option mostly for managers, highly skilled workers, and those in job roles with greater levels of autonomy, limitations related to lockdown and social distancing rules resulted in a need to allow many more workers to access these practices (Eurofound and the International Labour Office, 2017; Gonzalez Vazquez et al., 2019; Milasi et al., 2020). Overall, employees have responded positively to remote working and it is generally anticipated that the adoption of remote working practices will persist beyond the pandemic (Eurofound, 2020; Milasi et al., 2020). Notwithstanding this, the challenges and the potential psychosocial consequences associated with re-setting working practices must be considered (Kniffin et al., 2021). It has been suggested that previous research might have been skewed by self-selection bias, linked to the relatively limited access employees used to have to (voluntary) alternative work arrangements (Wang et al., 2021). Hence, there is a need to assess and understand individual characteristics associated with a positive adjustment to remote working. Organisations need to be able to provide tailored support to their employees.

The DRCF (Grant & Clarke, 2020) has provided a practical approach for individuals, managers and organisations to be able to assess the facets of remote worker performance and wellbeing, recognising that a 'one sized approach' to management of remote working does not meet all needs. This contribution presents a newly developed 15-item multi-faceted e-Work Self-efficacy scale (see Appendix) that is offered as an effective and comprehensive tool to support employees and their organisation to this end.

The results provided support for a bifactor model, identifying a general factor – corresponding to the domain specificity of remote working – and five specific factors - corresponding to the facets posited based on the DRCF developed by (Grant & Clarke, 2020). In particular, the scale assesses e-skills, trust building, self-care, remote social, and remote emotional self-efficacy. As such, the scale is capable to capture – with a limited set of items, which makes it particularly practical and quick to be administered – a nuanced and composed description of employee beliefs in key competencies for remote working.

The informative value of the scale has been further supported by findings from the Latent Profile Analyses, which confirmed the importance of assessing a range of facets within a functioning domain when measuring self-efficacy. Indeed, the Latent Profile Analyses allowed the identification of three clusters of employees:

a) a cluster comprising most of the employees (56.6%, Cluster 3), who could be labelled as "*Well-adjusted remote workers*", characterised by a high level of general e-work factors, along with medium levels of all the specific factors. These employees were well-adjusted to e-working and were able to balance their well-being and were more likely to be able to share best practices and support others;

and two additional clusters sharing an equivalent low level in the general e-work factor but characterised by different profiles in the specific factors. In particular,

b) a cluster comprising about a third of the employees (32.0%, Cluster 1), who could be labelled as "*Distrustful self-shielding remote workers*", characterised by high self-care self-efficacy, counter-balanced by low trust building self-efficacy, and medium levels in e-skills, remote social, and remote emotional self-efficacy;
c) a cluster comprising a lower proportion of employees (11.4%, Cluster 2), who could be labelled as "*Unhealthily dedicated remote workers*", characterised by low remote emotional, and very low self-care self-efficacies, counterbalanced by high e-skill, trust building, and remote social self-efficacy.

Membership to the identified clusters was significantly associated with most of the psychosocial variables as well as with demographic and organisational characteristics. As pertain to the psychosocial variables, significant differences emerged for all of them with the only exception of the flexibility dimension of the E-Work Life Scale, and techno overload of the technostress measure. Hence, members of the three clusters tended to have equivalent appreciation of the flexibility associated with remote e-working and the pressure that this type of working pattern can

cause. Besides that, the "Well-adjusted remote workers" had the highest scores in Organisational Trust, Work-Life Balance, Work Effectiveness/Productivity, Individual and Team Resilience, Engagement, Belongingness, and Work Satisfaction, while had the lowest scores in Technoinsecurity and Techno-complexity. The other two clusters showed a more articulated pattern of results. The "*Unhealthily dedicated remote workers*" shared the same low level of Techno-stress, and the same high level of organisation trust as the "Well-adjusted remote workers", possibly a result of their high level of e-skills and trust building self-efficacy. However, they had the same low level of Work Effectiveness/productivity, individual and team resilience, engagement, and work satisfaction as the "*Distrustful self-shielding remote workers*". Notwithstanding this, they scored higher than the "*Distrustful*" cluster in their sense of belongingness (although still significantly lower than the one reported by the adjusted remote workers). On the contrary, they had the worst perception of work-life balance across the three clusters, with the "*Distrustful self-shielding employees*" reporting an intermediate score (significantly lower than the adjusted remote workers).

While cluster membership was not associated with gender or caring responsibilities, there were significant differences among the clusters in relation to other demographic and organisational characteristics. The "*Distrustful self-shielding remote workers*" were more likely to be young (i. e., 18–24 years old), have a very limited experience of remote working, and wished to work remotely for a very limited proportion of their time in the future; they were also less likely to constantly check email and work outside of hours. On the contrary, the "*Unhealthily dedicated remote workers*" were more likely to remain constantly 'switched on'. Quite predictably, the "*Well-adjusted remote workers*" had a higher preference to retain a high proportion of remote working in the future.

In sum, the "*Distrustful self-shielding remote workers*" appeared to be the most compromised group, for whom the reasonable work life balance reported seemed to be the result of a self-protective strategy (possibly supported by their self-care self-efficacy), rather than the by-product of an efficient work practice. The "*Unhealthily dedicated remote workers*" tended to be slightly more adjusted than the *Distrustful* ones, but seemed to suffer some difficulties in setting boundaries as a result of their dedication to perform and deliver.

Self-efficacy beliefs are not stable or crystallised personality traits, on the contrary they are malleable and vary across time and situations. As such, these clusters should not be read and understood as fixed categories in which to group workers. These clusters should instead be considered as a dynamic way to examine and analysis individual differences. These profiles are subject to (and most likely will) change over time and provide clear evidence of the importance of concurrently considering different facets of employee e-working competencies. Indeed, while the general factor of e-work self-efficacy would help to identify those employees positively dealing with remote working arrangements, the interplay between the specific factors would pick up individual strengths and weakness, as well as possible compensative mechanisms across the diverse facets.

It has recently been noted of the importance of taking into account the fit between the individual, their characteristics and their remote working arrangements (Wang et al., 2021). In considering this fit, it is essential to recognise and acknowledge not only their digital skills but also, and even more so, their non-cognitive skills, which on the contrary are often overlooked (Gonzalez Vazquez et al., 2019). Previous studies have proved that remote working has the potential to positively impact productivity (e.g. Bloom, Liang, Roberts, & Ying, 2015). What we need to better understand is how to ensure its optimal impact on work conditions, individual wellbeing, engagement and team cohesion. This study, by concurrently considering engagement and belongingness, along with productivity, has broadened the perspective on the potential contribution that remote working may have on positive organisational outcomes. The DRCF (Grant & Clarke, 2020) provides a means for managers and organisations to be able to assess the efficacy and well-being of their remote e-workers. The DRCF helps to identify

training needs and areas for competency development that can be acted on at an individual, team or organisational level.

4.1. Theoretical and practical implications

From a theoretical point of view, this contribution provides further evidence of the informative value of Social Cognitive Theory to understand and analyse remote work (Raghuram et al., 2003; Staples et al., 1999; Staples & Webster, 2003). Furthermore, in continuity with previous research in the organisational setting (e.g. Barbaranelli et al., 2018), it highlights the relevance of adopting not only a domain-specific approach when operationalising self-efficacy, but also integrating a range of facets that within the domain under study might have an impact on individuals' behaviour and wellbeing.

Practically, it is anticipated that organisations will need to invest in technology and connectivity for their workforce to ensure that employees have the necessary tools to perform their tasks anywhere and without technical disruptions (Eurofound, 2020). However, this per se will not be enough, without a parallel effort in promoting and supporting employees develop their digital resilience competencies (Eurofound and the International Labour Office, 2017; Kniffin et al., 2021). Self-efficacy can be developed and sustained through mastery, vicarious experience, social persuasion and through the supporting guidance within the literature (e.g. Bandura, 1997). Hence, it is possible for organisations to design and promote training programmes to support employees develop digital resilience competencies in the key facets assessed through the e-Work Self-Efficacy scale in conjunction with the DRCF (Grant & Clarke, 2020). This would enable organisations to provide tailored approaches to supporting employees as well as a means to monitor changes and the effectiveness interventions.

In addition, study results point towards the need for organisations to have formalised policies and practices, that might help employees to set boundaries and adjust their work arrangements to their needs, while ensuring that work goals and objectives are met. Organisations might also need to establish training to ensure workers understand the health, safety, and wellbeing implications of remote working, as well as the development of optimal new knowledge, skills and behaviours. One principle that has often been cited is the "right to disconnect" (Eurofound, 2020; Eurofound and the International Labour Office, 2017), which might help to avoid or at least reduce the "invasion" of work into personal life. The e-work Self Efficacy scale and the DRCF together are intended to support effective remote working, doing so through integrating technology and giving employees the flexibility to choose where/when to work that delivers the best personal and work outcomes. Boundaries do need to be set and employees and managers need to establish these together, clearly setting and agreeing expectations on what is or is not acceptable in terms of behaviour, requests, and job demands. This should also result in discussions moving from 'activities to be performed' or 'time worked' to an 'outcomes' based approach to assessing performance.

4.2. Limitations and future studies

While reaffirming the theoretical and practical value of the present contribution, several limitations must be acknowledged. First, this study has been conducted in a single European country, and it would be pivotal to replicate its findings in different contexts, since the literature has underlined the impact of socio-cultural elements on remote working practices and outcomes (Bana, Benzell, & Solares, 2020; Peretz, Fried, & Levi, 2017). Second, the current findings are derived from cross-sectional data, and it is paramount to extend the analyses considering longitudinal and potentially multilevel data sets to evaluate causal relationship, as well as the interplay between different organisational actors. Linked to this, there is a third limitation which is associated with the papers focus on employees without managerial responsibilities. It would be equally important to investigate the role of

self-efficacy beliefs in managers, considering the challenges that a shift in working practices might imply for them. In particular, and as suggested by Allen et al. (2015), it is expected that the success of remote working practices will depend on an intertwined set of individual, organisation, and logistic factors. As such, a multilevel and multi-informant approach may be highly informative and derive additional insights. Furthermore, the lockdown associated with pandemic resulted in a very limited capacity (if at all) for both employees and employers to modulate the proportion of face-to-face and remote working arrangements, which is considered a relevant moderator (e.g. Allen et al., 2015; Gajendran & Harrison, 2007; Raghuram et al., 2003). Post pandemic, it will be necessary to investigate whether it is possible to identify an ideal balance between remote and face to face working, considering the optimal impact on productivity, engagement, belonging and wellbeing. Similarly, based on literature examining the impact of individual differences on working arrangement preferences (Rothbard, Phillips, & Dumas, 2005), future studies could also examine whether and to what extent e-work self-efficacy has the same impact on personal and work-related outcomes for both *segmentors* (namely, individuals who tend to keep family and work roles separated) and *integrators* (namely, individuals who tend to blur the boundaries between family and work roles).

5. Conclusion

COVID-19 has accelerated a transformational process that was already happening in the workplace, changes driven by rapid advancements in technology. Remote working practices are expected to become more accessible to many more workers in the post-COVID era, benefiting both employers and employees. To fully realise these benefits, namely increased flexibility and greater autonomy, digital resilience competencies need to be acquired and developed to mitigate potential associated risks. The e-work self-efficiency scale provides a practical tool for organisations and employees to assess their remote working effectiveness, pinpointing specific areas for training and development. Through building targeted e-working competencies, individuals will become more resilient and organisations stand to benefit from increased engagement, higher productivity and employees working remotely in a healthy and sustainable way.

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Declaration of competing interest

Carl Clarke is employed by Vodafone Group where the data has been collected, and independently contributed to this article that builds on an MSc research project at Coventry University, supervised by Dr Christine Grant, and work published afterwards.

ANNEX

Scale Items

When work remotely, how well can you …

1. manage your time effectively, even if you have to juggle personal and professional commitments?

2. organise your activities, despite any distractions in your surroundings?
3. plan your activities effectively, despite disruptions you might have?
4. complete your tasks, even with minimal supervision?
5. self-manage your time ensuring to complete your tasks on time and to a high standard?
6. constantly abide by organisational rules and policies, even when a shortcut could help you to complete your tasks more quickly?
7. understand when technology usage is impacting your wellbeing, even if you are very focussed on some work task?
8. take actions if you realise that being "always on" is becoming too much?
9. use different coping strategies to deal effectively with periods of high workload?
10. use a range of different digital communication tools to quickly build rapport with others?
11. utilise a range of social networking tools to maximise your work relationships?
12. build networks (including virtually) with diverse groups of people?
13. avoid feeling anxious if you receive work notification outside the working hours?
14. manage your working hours as you prefer, without feeling guilty for not being online when your other colleagues are?
15. not worry that your colleagues will doubt you are actually working?

Response scale.
1 = Not at all; 2 = slightly; 3 = Somewhat; 4 = Very Well; 5 = Completely.
Specific Factors.
E-skills Self-Efficacy: items 1 to 3;
Trust Building Self-Efficacy: items 4 to 6.
Self-care Self-Efficacy: items 7 to 9.
Remote Social Self-Efficacy: items 10 to 12.
Remote Emotional Self-Efficacy: items 13 to 15.

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