


COMMENTARY

Let's get on the same page: Conceptual clarification of individual-level information and communication technology use

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In their review of decades of research on the role of information and communication technology (ICT) in industrial-organizational (I-O) psychology, Hu et al. (2021) reflect on key constructs, empirical findings, and theories. They identify two major theoretical perspectives through a “defragmentation” of the segmented literature—namely, the technology behavior perspective and the technology experience perspective. The technology behavior perspective reveals that ICT can enable employees to work away from the office, work after hours, and engage in non-work-related online activities during work hours, which in turn, will affect work effectiveness and well-being. The technology experience perspective, on the other hand, addresses the motives underlying ICT-use behaviors and how ICT-related events are viewed by employees. As scholars who share similar research interests and have also systematically reviewed workplace ICT research recently (Wang et al., 2020), we welcome Hu et al.'s analysis and agree that a “defrag” and “reboot” can indeed “provide an opportunity to move this exciting area of research forward” (Hu et al., p. 371).

At the same time, however, we identify ways to advance this topic. Specifically, we identify three limitations of Hu et al.'s (2021) review. First, we suggest that the review fails to provide a clear definition of individual-level *ICT use* at work, which hinders dialogue across different streams of research. Second, the authors theoretically separated technology experiences from technology-use behaviors, which in our opinion will constrain our understanding of ICT-related constructs. Third, although the authors draw on a work design perspective to discuss the literature, they overlook the more powerful role of work design theory for understanding ICT-related phenomena in the workplace. We address these limitations next.

What is ICT use? Incorporating technology, humans, and tasks into the definition

Ambiguous definition, construct proliferation, and fragmented literature

We share Hu et al.'s (2021) concerns about the “construct-proliferation” problem in the existing literature and agree that defining individual-level ICT use is a crucial step in consolidating previous research. Currently, synthesis across diverse streams of research is hindered because there are different conceptualizations of ICT use, making findings incomparable across studies. Unfortunately, however, Hu et al. do not give a clear definition of ICT-use *behaviors* in their review. Rather, employing the technology behavior perspective, the authors identify three different streams of research on ICT-use behaviors: *where* and *when* we use ICT and for *what* we use it. Although the “where, when, and what” categorization is useful in consolidating previous research, a clearer definition of ICT use is needed to synthesize the existing literature.

Toward a clear definition of individual-level ICT use

Following Wang et al. (2020), we recommend drawing on Burton-Jones and Straub's (2006) approach to define individual-level ICT-use behaviors as “*an individual user's employment of one or more features of ICT to perform a task.*” The theoretical advantage of this approach is that it explicitly reflects the intertwined relationships between technology, humans, and tasks. Further, we recommend drawing on the expanded definition of ICT use-behaviors developed by Wang et al., which identifies that ICT-use behaviors include two fundamental elements: (a) *the extent to which a user employs ICT*, which is labeled as “ICT-use intensity” (indicating the relationship between technology and humans), and (b) *the way ICT is used to carry out tasks*, which is labeled as “functions of ICT use” (indicating the relationship between technology and tasks). Both elements convey unique information and should be considered together to fully understand ICT. For instance, we cannot really predict the social consequence of “using ICT to support collaboration and communication” in remote working without knowing the extent to which remote workers use ICT (e.g., how often they communicate virtually) and the functions of the ICT use (e.g., whether they are communicating for work or for social purposes).

We assert that Burton-Jones and Straub's (2006) definition of ICT use, along with the two components as Wang et al. (2020) suggested, can help to integrate the streams of literature that were identified in Hu et al.'s (2021) review. Specifically, inconsistent findings in telecommuting and virtual team research can be reconciled by capturing the individual-level ICT-use behaviors of use intensity and function of ICT use. For example, managers often assume that telecommuting will help balance work–family conflicts (Allen et al., 2015), yet one study that was conducted during the COVID-19 outbreak (Wang et al., 2021) showed that two thirds of the interviewed participants experienced struggles with work–family conflicts while remote working. Our approach helps to interpret this apparently contradictory result: That is, the pandemic changed the way of using ICT in remote working, increasing the intensity (i.e., people are using ICTs intensively) and changing the functions of ICT use (i.e., people are using ICTs for numerous purposes, such as using ICTs for work-related purposes after regular working hours), which potentially made remote working less positive for home–work balance.

In addition to advancing the telecommuting and virtual team literature, our approach is conducive to integrating research that investigates cyberloafing and work-break behavior. As Hu et al. (2021) criticized, although research about both cyberloafing and work-break behavior focus on using ICT for nonwork purposes in the workplace, the theoretical focus has been divided. We believe this segmentation is caused by different approaches to understanding ICT use. The cyberloafing literature frames non-work-related ICT use during working time as a type of counterproductive behavior, whereas work-break-behavior research views this ICT behavior as a type of work break. In other words, cyberloafing and work-break-behavior literature have conceptualized ICT-use behaviors based on the desirability of its outcomes yet overlooked the intensity and functions of ICT use. In fact, the effects of non-work-related ICT use on performance and well-being are jointly influenced by use intensity and functions of ICT use. For example, moderate-intensity ICT use for hedonic purposes can help users recover from job strain, but excess hedonic use likely hinders accomplishing organizational goals. The function of ICT use also matters. Bizzi's (2020) study reveals that using internal blogging with coworkers promotes users' intrinsic motivation but using personal blogging with outsiders reduces users' intrinsic motivation.

In sum, the absence of a clear and comprehensive definition of individual-level ICT use, along with the existing problem of construct proliferation, has exacerbated the fragmentation of research on workplace ICT use. Based on Wang et al.'s review (2020), we recommend that future researchers design studies that explicitly capture workplace ICT-use behaviors by theorizing around and empirically measuring the two fundamental components: ICT use intensity and functions of ICT use.

What shapes technology experiences? Integrating technology use and technology experience research

A major research stream identified by Hu *et al.* (2021) is the technology experience perspective, which emphasizes psychological experiences arising from technology. Yet studies in this tradition are silent about how ICT is used and how ICT use shapes individual psychological experiences. It is important to bridge the divide between technology-use and technology-experience research.

From a theoretical standpoint, linking technology experiences with ICT-use behaviors helps to clarify the uniqueness of ICT experience constructs (e.g., technostress). Hu *et al.* (p. 371) asked a critical question: “Are ICT constructs conceptually distinct from their nontechnological counterparts already in the literature, or are we just creating ICT-specific constructs by adding prefixes (e.g., “techno-,” “cyber-,” “tele-”) to existing I-O constructs?” Unfortunately, their review reveals that the existing literature fails to directly address this question. Especially for studies from the technology experience perspective, scholars usually regard ICTs as an organizational context and do not assess technology behaviors when considering “technology experiences.” This approach is likely to be problematic because scholars only focus on outcomes of human–technology interactions in the workplace, with technology fading into the background (Orlikowski & Scott, 2008).

We argue that the uniqueness of current ICT-related constructs should be understood by how these constructs emerge in the technological work context. On one hand, ICT use at work has changed the way people work, which requires scholars to develop new constructs to understand new phenomena. Take the “constant availability” demand as an example: When ICTs were not commonly used in the workplace, work and nonwork domains were separated by work schedule and physical space. However, the widespread use of advanced ICTs in communication makes the invasion of work-related issues into personal life possible, resulting in the demand for constant availability (Mazmanian, 2013). Thus, as a consequence of workplace ICT use, constant availability is conceptually different from other long-existing constructs, such as work demands (e.g., workload). On the other hand, ICT use changes the nature of some existing constructs. Cyberbullying, as a typical example, has a set of unique characteristics, and it is distinct from (offline) conventional bullying. Perpetrators’ underlying motives to bully others could be different in ICT-mediated interactions, and people might commit acts that they would never commit in real life. For victims, the permanence of content might increase the severity of cyberbullying. Thus, it is appropriate to update and extend our understanding of this new form of bullying in the online context. In sum, using ICTs at work can lead to the birth of new constructs or give existing constructs new meanings. It is not helpful to discuss the uniqueness of current ICT-experience constructs without considering how ICT-use behaviors shape such experiences.

From a practical standpoint, integrating research about technology experiences and technology behavior is beneficial for employees and managers with respect to maximizing the bright side of ICT use at work and protecting employees from detrimental ICT experiences. Hu *et al.* (2021) articulated that “ICT features and events could be appraised to be either demanding or supporting contingent on contextual and individual factors” (p. 371). We agree with their argument, but we believe this appraisal perspective treats users as passive recipients, and it doesn’t sufficiently consider how people can actively interact with the technology to change their experience. According to Wang *et al.*’s framework (2020), individual users can proactively cope with ICT-related challenges. That is, people can adjust their ICT-use behaviors to fit with their personal characteristics (e.g., personal preferences) or their embedded social context (e.g., social norms), thereby achieving desirable ICT-use experiences. It is also important for managers to attend to ICT-use behaviors—that is, exactly how exactly ICT is implemented and used at work. This is because implementing new technology may not necessarily lead to desirable technology experiences. Different ways to use technology can contribute to different individual outcomes. Thus, what managers should do is to consider end users’ needs in technology development, provide necessary technical support, and

empower end users to customize their use, thereby ensuring ICT is used artfully in practice (Parker & Grote, 2020).

Altogether, the technology use and technology experience literature are traditionally separate, but this constrains research in understanding the uniqueness of ICT-related constructs and the proactive role of humans. We encourage uniting these two segmented research streams. Next, we introduce Wang et al.'s approach (2020) to achieving this integration via a work-design perspective.

Work design: An alternative perspective to integrate ICT research in the I-O field

The focal article linked aspects of ICT-related research with a work design perspective. In the stream of technology behavior, Hu et al. (2021) discussed how ICT use influences where and when people work (identified as relevant to work design), which in turn sparks interest in research on virtual team and ICT-use behaviors during nonwork time. In the stream of technology experience, the authors focused on ICT-related demands and resources. Unfortunately, Hu et al. do not further incorporate work design theory into their perspective; instead, they recommend theories developed from computer-mediated communication and management information systems areas (e.g., media richness theory). These theories can indeed help researchers to understand general ICT-related phenomena, yet, they fail to consider how ICT use and related psychological experiences link to the work context. In addition, technology is usually assumed to play a deterministic role in these research traditions, resulting in a relatively passive position for individuals, managers, and organizations. Because of that, scholars recently have recommended leveraging well-established management and organization theories to update and extend our understanding of ICT-related phenomena in the workplace (e.g., Wang et al., 2020).

Based on recent theoretical work (Parker & Grote, 2020; Wang et al., 2020), we propose work design theory as a powerful perspective for understanding the use of ICT in the current digital workplace. Work design (or job design) is about “the content and organization of one’s work tasks, activities, relationships, and responsibilities” (Parker, 2014, p. 662). Scholars have developed various work design theories to understand emergent work characteristics or new challenges at work caused by technological innovations (Bodrožić & Adler, 2018).

Building on work design theories, Wang et al. (2020) proposed a theoretical framework for guiding ICT-related research. One idea from their framework is that ICT use can affect individuals through shaping the nature of the work design (i.e., changing a set of work characteristics). Taking enterprise social media usage (e.g., Microsoft Teams) in the remote working context as an example, using such a technology for collaboration can increase job autonomy (because people can work without temporal and spatial limits) and at the same time increase job demands, such as ICT-related hassles. Given that there is already much theory and evidence about how work characteristics affect people’s experiences and outcomes, once we know which work characteristic has been affected by ICT use, we can link it to existing knowledge in the I-O field to predict subsequent consequences.

Importantly, our framework indicates that, the effects of ICT use on work design are not deterministic. As Wang et al. (2020) identified, ICT use can lead to desirable employee outcomes via work designs wherein the usage of ICT coincides with personal and social/organizational factors, but it will hurt individuals when the usage does not fit well with personal and social/organizational characteristics. For example, employees with greater time management ability are likely to benefit more from ICT use at work in terms of increasing autonomy.

The work design perspective has two theoretical advantages. First, the work design perspective contends that ICT use is important because it contributes to shaping the social and task systems in the workplace. We acknowledge that ICT use has a direct effect on users’ psychological experiences. However, individual outcomes are not merely caused by human–technology interactions;

instead, ICT use can change the work system in which individuals are embedded, thereby influencing people's context very fundamentally. The work design perspective contributes to shedding light on this process by considering work characteristics as a key mechanism for linking ICT-use behaviors and employee outcomes. Second, the work design perspective bridges the gap between ICT-related phenomena and existing research in the work context. The work design literature offers well-established theories for understanding the effects of work characteristics on employees. Thus, by putting work design in the central position in our framework and asking, "How does ICT use affect work design?" we build on the accumulated knowledge to deepen our understanding of ICT-related phenomena.

Conclusion

We welcome Hu *et al.*'s (2021) synthesis of existing ICT-related research in the I-O field but suggest that this review can be strengthened in three ways. First, we have argued that a clear and comprehensive definition of individual-level ICT use, including use intensity and function, is a helpful foundation to use for integrating contemporary knowledge on the role of ICT use in the workplace. Second, we recommend that future researchers consider concrete ICT-use behaviors in technology experience research. Third, we assert that the work design perspective can be a powerful framework for developing research on ICT use in the field of I-O psychology.

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