Sources of Individual Differences in Adults' Digital Skills

Wicht, Alexandra; Reder, Stephen; Lechner, Clemens

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ABSTRACT

We develop an integrative conceptual framework that seeks to explain individual differences in digital skills. Building on practice engagement theory, this framework views the continued usage of digital technologies at work and in everyday life (ICT use) as the key prerequisite for the acquisition of digital skills. At the same time, the framework highlights that ICT use is itself contingent upon individual and contextual preconditions, most notably literacy skills. We apply this framework to data from two recent German large-scale studies (total N 5,281) that offer objective measures of adults’ digital skills. Findings support our framework’s view of ICT use as a key prerequisite for digital skills. Moreover, they demonstrate that literacy skills have strong associations with digital skills, largely by virtue of their indirect associations through ICT use. By comparison, regional digital cultures evince only limited explanatory power for individual differences in digital skills.

KEYWORDS

Digital skills; Digital divide; ICT; Literacy; Practice engagement; Skill use
1 DIGITAL SKILLS IN THE INFORMATION AGE

Across the past two decades, digital skills—that is, the ability to use information and communication technologies (ICT for short; International ICT Literacy Panel 2007)—have gained currency for individuals and societies alike. As a consequence of this digital transformation, digital skills have become a fault line along which new social inequalities emerge (e.g. Falck et al. 2016).

Given the growing importance of digital skills, it is an important question how individual differences in digital skills arise. However, as yet, evidence on adults’ digital skills is sparse, scattered, and lacks theoretical integration. In the present study, we develop a conceptual framework that aims at a better understanding of how individual differences in adults’ digital skills arise. Furthermore, we bring this framework to an empirical test by using data from two German large-scale studies offering high-quality objectively assessed measures of adults’ digital skills: the “Programme for the International Assessment of Adult Competencies” (PIAAC, see Rammstedt 2012) and the “National Educational Panel Study” (NEPS, see Blossfeld et al. 2011). As yet, only a few studies exist that drew on such objective, standardized measures of adults’ digital skills to pinpoint these skills’ potential determinants (e.g. Desjardins and Ederer, 2015; Hämäläinen et al., 2015).

2 INTEGRATIVE CONCEPTUAL FRAMEWORK

Dominant theories of skill acquisition such as practice engagement theory (Reder 2009) assign a key role to social practices, that is, ICT use in settings such as the workplace or everyday life. ICT use is likely to be of particular relevance to the acquisition of digital skills because current cohorts of adults typically received little or no formal training in digital skills but had to acquire them through non-formal and especially informal learning processes, that is, through “learning by doing” (Wicht et al., 2018). However, ICT use does not operate in a vacuum and itself depends critically on a number of prerequisites. Chief among them are the opportunities and encouragements to engage with ICT offered by the multi-layered contexts in which individuals’ live (Bryner et al. 2008) on the one hand, and individuals’ endowment with literacy skills (van Deursen and van Dijk 2016), which are indispensable in order to engage with (heavily text-based) digital technologies on the other.

Our unified conceptual framework, shown in figure 1, summarizes these key ideas and distinguishes between three levels relevant for adults’ ICT use and digital skills based on the findings of previous research: the individual level (particularly represented by individuals' literacy skills (van Deursen & van Dijk 2016, but also other sociodemographic characteristics, see e.g. Desjardins and Ederer 2015), the level of micro-contexts (represented by the workplace and in everyday settings in which ICT use takes place, see e.g. Reder 2015), and the level of more distal macro-contexts (represented by digital culture at the regional level, see e.g. Salemink et al. 2017). It is mainly through their influences on ICT use that factors on the individual, micro-contextual and macro-contextual level are thought to influence the acquisition of digital skills.

3 RESULTS

We present the results of our analyses based on PIAAC and NEPS in figure 2. In all models, we control for traditional socio-demographic variables, including gender, age, and migration status, which are not reported. All in all, the results for both kinds of data sources give a similar picture: While the association between digital culture (measured by internet registrations per capita at the level of German districts) and individuals’ digital skills is only moderate (Models 1) ICT use on the job and in everyday

life are strongly related to individuals’ digital skills and in part mediates the association between digital culture and digital skills (Model 2; paths II and I).

The sources of the association between ICT use and digital skills can be revealed after taking into account individuals’ literacy skills (Models 3); in addition, we control for the level of formal education. Introducing these variables leads to a decline of $\frac{1}{2}$ of the initially large regression coefficients for ICT use. Thus, the positive association between literacy and digital skills is largely mediated by individuals’ ICT use (paths IV and I). However, both ICT use variables (i.e. at work and in everyday life) are still incrementally related with digital skills.

4 Conclusion

Our study contributes to research on the origins of individual difference in adults’ digital skills in several ways. In line with our framework, our findings highlight that digital skills do not emerge in a vacuum but are strongly contingent on individuals’ ICT use at work and in everyday life. That is, adults acquire digital skills largely through “learning by doing”. At the same time, our findings direct attention to the preconditions of ICT use. Above and beyond well-established socio-demographic characteristics, we identify individuals’ literacy skills as a key precondition for both ICT use and digital skills.

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6 References


