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# Digital technologies in training and adult education

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Digital technologies are vital for training, adult education and human resource development in many organizations (Gegenfurtner *et al.*, 2018; Thalhammer, 2014). The increasing use of technology-mediated environments affords flexible, ubiquitous and on-demand access to learning material. For example, employees can develop their knowledge and skills in the learning management systems (LMS; Dowling-Hetherington *et al.*, 2020; Testers *et al.*, in press), in webinars (Ebner & Gegenfurtner, 2019; Gegenfurtner & Ebner, 2019; Gegenfurtner *et al.*, 2020), or with digital video-based scenarios (Dowling-Hetherington *et al.*, 2020; Kraiger *et al.*, 2020). Nevertheless, despite the advantages of technology-mediated learning environments, human resource developers and trainers would benefit from having more knowledge about how trainees benefit when they learn digitally, what they experience and how they perceive online training. Furthermore, we need more knowledge about the competencies needed for trainers to skillfully navigate, orchestrate and work within digitally technology-mediated training contexts (Koehler *et al.*, 2014; Oberländer *et al.*, 2020; Rohs *et al.*, 2019; Schmidt-Hertha & Rohs, 2018). Hence, and in addition to the producing studies of trainees' experiences and perceptions, researchers need to address more deeply the digital competencies, skills and attitudes of trainers toward the digital media and infrastructures (Bonnes *et al.*, 2020; Rohs *et al.*, 2020).

This special issue for the *International Journal of Training and Development* aims to address how trainees and trainers experience and work with digital technologies in the adult education and human resource development. To meet this aim, five empirical studies were invited. Table 1 provides an overview. The five studies examine the data collected in Asian, European and North American training contexts, relate to various technologies and cover trainees and trainers respectively.

In the first contribution, Gegenfurtner *et al.* (2020) use a mixed methods approach to analyze the affective reactions of trainees who participated in webinar-based training programs. Using a combination of quantitative survey and qualitative interview data, their study finds that trainees were satisfied and reacted positively toward the direct, synchronous communication with the facilitators and peer students in their

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Table 1: Overview of studies in this special issue

#	Authors	Group surveyed	Technology	Country	Focus	Participants
1	Gegenfurtner et al.	Trainees	Webinars	Germany	Affective reactions	419 trainees
2	Dowling-Hetherington et al.	Trainees	LMS, Cloud, Video	Ireland, Singapore, Hong Kong, Sri Lanka	Expectations and experiences	928 business students
3	Kraiger et al.	Trainees	Video	USA	Learning, affect, cognitive load	412 and 57 learners
4	Rohs et al.	Trainers	Digital media	Germany	Attitudes	626 adult educators
5	Bonnes et al.	Trainers	Digital media	Germany	Competencies, self-efficacy, attitudes, use	279 adult educators

webinars. Furthermore, the findings suggest that trainees preferred webinars no longer than 90 minutes, webinars on weekdays after work rather than at weekends, and to use webinars to have virtual consultation hours with the facilitator. Overall, the study contributes to the growing evidence of the effectiveness of webinar-based training (Gegenfurtner & Ebner, 2019).

In the second contribution, Dowling-Hetherington *et al.* (2020) address learners' expectations regarding the level of faculty usage of technology tools and their experiences with how facilitators used digital technologies to enhance learning. Using a quantitative survey approach, their analyses suggest that the most commonly used tools to support student learning include the LMS, file sharing in clouds and internet search tools. Although this contribution was situated in higher education contexts, the results are valuable also for the professional learning and human resource development because, first, they indicate the importance of human interaction in learning settings and, second, that digital technologies should complement – not replace – more traditional face-to-face training environment in blended learning scenarios.

In the third contribution, Kraiger *et al.* (2020) report the outcomes of two experiments in which they studied effects for learning prompts in older adults aged 55 to 70. Using an experimental approach, their findings indicate that older learners perform worse in online training when prompts are provided than when they are not. This result was independent of the type of prompt used: elaboration prompts (making connections of new training content to previous knowledge or experiences) and meta-cognitive prompts (self-evaluating the learning progress). Effects on the affect and cognitive load were statistically nonsignificant. The authors conclude that when designing short training videos for older learners, learning prompts seem to have no additional benefits.

In the fourth contribution, Rohs *et al.* (2020) examine the attitudes and competencies of adult educators. Using quantitative online survey data, their analyses signal that educators with higher educational attainment and with higher levels of media-related training were significantly more positive and critically reflective toward the digital media. Moreover, adult educators who worked in adult education centers were less critically reflective. Differences between younger and older adult educators in their attitudes and competencies were nonsignificant. Overall, the study is highly informative as it examined differential aspects such as age, educational background, employment and participation in media-related training courses as surrogates for the media habitus of adult educators.

In the fifth and final contribution, Bonnes *et al.* (2020) investigate the relationships among media-didactical competence, media-didactical self-efficacy, attitudes toward the use of digital media and the actual use of digital media in training. Using quantitative data from an online survey of adult educators, their findings demonstrated that self-reported media-didactical competence was unrelated to self-efficacy and use of digital media in training. Furthermore, self-efficacy was positively related to use of digital media in training. Adult educators who participated in a course on digital media reported higher estimates of media-didactical competence, higher self-efficacy, more frequent use of media and less negative attitudes toward the digital technologies than adult educators not participating in this course. Overall, the study indicates the importance of examining trainers' competencies in digitally, technology-mediated environments (Schmidt-Hertha *et al.*, 2017).

The five contributions in this special issue reflect on a number of issues, for example, the competence level of trainers (Bonnes *et al.*, 2020; Rohs *et al.*, 2020) and how these are affectively perceived by the trainees (Dowling-Hetherington *et al.*, 2020; Gegenfurtner *et al.*, 2020). This issue is in line with previous research in the field of digital training (e.g., Koehler *et al.*, 2014; Rohs *et al.*, 2019; Testers *et al.*, in press). Another issue reflected in the contributions of this special issue is associated with the potential benefits of digital training environments or, in the case of Kraiger *et al.* (2020), when training environments are not complemented with prompts. What these contributions also reveal is that simple solutions – such as no additional prompts (Kraiger *et al.*, 2020) or traditional face-to-face scenarios (Dowling-Hetherington *et al.*, 2020) – have

their values, too, and should be considered alongside more elaborate digital alternatives. Finally, the studies highlight how affective and cognitive aspects of learning in technology-mediated settings are intertwined (Bonnes *et al.*, 2020; Gegenfurtner *et al.*, 2020). It is important to continue these lines of research using the qualitative, quantitative and mixed methods to further our understanding of digital technologies in training and adult education.

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