Information Systems and e-Business Management (2025) 23:999–1038
https://doi.org/10.1007/s10257-025-00708-3

ORIGINAL ARTICLE

Too old to find employment? A novel approach to leverage the power of digital peer groups for older unemployed

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Received: 24 November 2023 / Revised: 12 March 2025 / Accepted: 7 April 2025 /
Published online: 19 May 2025

Abstract

Unemployment is a pressing societal problem world-wide. The consequences of unemployment are disproportionately more severe for older individuals. Building on literature on digital technologies in the context of unemployment and social support in digital peer groups, we design and evaluate a novel job counseling approach to leverage the power of digital peer groups to assist older unemployed individuals in regaining employment. Our approach supplements the traditional one-on-one offline counseling. It is specifically designed for older unemployed individuals, with small group sizes, moderation, and implementation through an easily accessible online messenger. We demonstrate the practical applicability of the proposed approach by instantiating it in cooperation with the German Federal Employment Agency, and we demonstrate how the approach can be used in terms of mutual social support. We evaluate the efficacy of the approach in a controlled, randomized field experiment with 987 older unemployed individuals. The results demonstrate the approach's positive impact on reemployment chances of older unemployed individuals, by increasing their job search skills and job search intensity. Furthermore, our evaluation reveals that gender and job market situation are important contextual factors for the effectiveness of the digital peer group-based approach, warranting further recognition in research.

Keywords Unemployment · Digital peer groups · Reemployment · Social support · Older workforce

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1 Introduction

Unemployment of older individuals is a severe problem for both the affected individuals and society. Prosperous and resilient growth requires an active workforce participation of all ages and in times of skilled labor shortage, stronger labor force participation of older people is required (OECD 2019, 2024; Destatis 2023). A fifth of the EU's employable population and workforce is above the age of 55 (Eurostat 2020; ECB 2022; Destatis 2023). However, older individuals face significant challenges on the job market: they are more likely to be furloughed (Crawford et al. 2021), have an elevated unemployment risk and lower reemployment chances (Tisch 2015). Accordingly, older individuals often remain underrepresented on the labor market. Taking the example of Germany, 26% of individuals between the age of 55 and 64 are not engaged in work—neither employed nor actively seeking employment—compared to 21% of those generally able to work (DGB 2024). The consequences of unemployment are disproportionately more severe for older individuals, who suffer larger psychological losses, age discrimination, and long-term financial dependency (Klehe et al. 2012; Wübbeke 2013; Murdock et al. 2021). Against this background, research and practice alike are calling for action to tackle unemployment of older individuals (Tisch 2015; OECD 2020).

In that realm, prior studies have shown that peer groups might be an answer to this problem as they support individuals overcoming a wide variety of challenges. Peer groups are defined as "voluntary, small group structures for mutual aid and the accomplishment of a special purpose. This special purpose can be a common need, overcoming a common handicap or life-disrupting problem, and bringing about desired social and/or personal change" (Katz and Bender 1976, p. 278). Overcoming unemployment of older individuals constitutes such a special purpose. Research indicates that digital peer groups might be beneficial to combat unemployment through fostering mutual social support, thereby improving job search self-efficacy (Felgenhauer et al. 2019a) and employment outcomes (Klier et al. 2019). Research shows that older unemployed individuals are open to employing digital technologies in their job search (e.g., Dillahunt et al. 2021), given that digital offerings consider their specific needs and requirements (Xie et al. 2021; AGE 2023). Designing digital peer groups specifically for older unemployed individuals offers the unique opportunity to increase their access to digital technologies for job search (Huang and Zhang 2022) and support their navigation of an increasingly digitalized job search process (Kanfer et al. 2020; Seifert et al. 2020). However, to date, no digital peer group-based approach to assist older unemployed individuals in finding employment has been proposed and evaluated on a large-scale. To contribute to this research gap, we pose the following research question: how can an approach based on digital technologies and peer groups be designed, that helps address unemployment of older individuals? By answering this research question, we aim to tackle the severe problem of unemployment of older individuals.

To answer this research question, we follow the design science research paradigm (Hevner et al. 2004) and build on literature on digital technologies in the context of unemployment as well as literature on social support in peer groups to propose a job

counseling approach designed to leverage the power of digital peer groups assisting older unemployed individuals in regaining employment. We demonstrate the practical applicability of the approach by instantiating it for the case of the Germany Federal Employment Agency, and we show how the approach can be used in terms of mutual social support. We evaluate it with respect to its impact on reemployment by means of a controlled, randomized field experiment with 987 participants in cooperation with the Federal Employment Agency in the state Baden-Wuerttemberg. While the focus of our evaluation is on the overall efficacy of our approach, we also provide first insights into when and for whom the approach is particularly effective.

The results of our field experiment prove the overall effectiveness of our digital peer group-based job counseling approach to combat unemployment of older individuals in terms of increasing their job search skills and job search intensity. We find that the effectiveness of digital peer groups differs for men and woman as well as when applied during a job market crisis, i.e., the COVID-19 pandemic. Our novel peer group-based approach is especially effective for women, who improve their job placement success during the COVID-19 pandemic. However, both men and women increase their reemployment chances through better job search skills and higher job search intensity.

Our contribution to research is twofold: first, leveraging the potential of digital technologies, we propose the first digital peer group-based approach specifically designed to assist older unemployed individuals in finding employment. Our target group is defined as unemployed individuals over the age of 50, in accordance with the definition of "older unemployed" applied by many governments and international and intergovernmental organizations (OECD 2006; Bosch et al. 2019). With our novel approach, we help tackle the severe problem of unemployment of older individuals. Second, our naturalistic and summative evaluation in the form of a large-scale field experiment provides novel insights into the effectiveness of digital technologies, in particular digital peer groups, to address unemployment of older individuals. Existing research on digital technologies in the context of unemployment predominantly neglects the relevant target group of older job seekers, who are willing and able to successfully leverage tailored digital technologies in their job search (Klier et al. 2020; Dillahunt et al. 2021; Sigler 2021). We expand this body of literature by showing that digital technologies specifically targeted at older unemployed individuals can improve their job search intensity and job search skills. Moreover, our study provides indication that the effectiveness of digital technologies to address unemployment of older individuals is contingent on gender and job market situation, warranting further recognition in research.

The research presented in this paper is structured as follows: Sect. 2 describes the problem context. In Sect. 3 we present related work on digital technologies in the context of unemployment. Section 4 incorporates the theoretical background of digital peer groups. In Sect. 5 we present the design of the novel digital peer group-based job counseling approach for older unemployed individuals. Section 6 comprises demonstration of practical applicability and evaluation of efficacy of the approach. In Sect. 7 we discuss implications and limitations of our research and provide directions for future research. Finally, we conclude with a summary in Sect. 8.

2 Problem context

The problem context of this study is unemployment of older individuals. Society has a significant interest in ensuring that older individuals remain in the workforce, leveraging their extensive experience (Wang and Shultz 2010). Especially given the pressing skilled labor shortages, it becomes increasingly crucial that older individuals contribute actively to the labor market (OECD 2024). At the same time, the consequences of unemployment are disproportionately more severe for older individuals (Klehe et al. 2012; Wübbeke 2013; Bui et al. 2020; Murdock et al. 2021). For instance, once becoming unemployed, older individuals are at a higher risk of staying unemployed, leading to income cuts and a decline in their mental and psychological health (Murdock et al. 2021). Research indicates that most unemployed individuals experience significant negative psychological effects due to the discrepancy between their desire to reenter the workforce and the frequent lack of success in their job search (Brauer 2009; Wübbeke 2013). However, this issue is particularly pronounced among older unemployed individuals. Older individuals often remain unemployed for longer periods than their younger counterparts or may not return to the workforce at all. Additionally, they are more likely to face perceived or actual age discrimination, which further exacerbates the psychological strain (Wübbeke 2013).

Around the globe, elderly people face a higher unemployment risk and lower reemployment chances (Tisch 2015). Getting unemployed at an older age often leads to a job market exit (Bui et al. 2020). Age discrimination is a significant barrier for older unemployed individuals trying to reenter the job market (Bui et al. 2020; Kanfer et al. 2020). In addition, due to a lack of digital skills and resources, older job seekers face significant challenges when trying to navigate an increasingly digitalized job search process, including digital platforms, virtual job fairs, or online job interviews (Kanfer et al. 2020; Seifert et al. 2020). At the same time, studies suggest that older unemployed individuals are willing and able to successfully leverage digital technologies in their job search, given that these digital technologies are tailored to the older unemployed individuals' resources (e.g., Klier et al. 2020). Amongst older unemployed individuals, men and women find themselves in different job market situations (Criado-Perez 2019). Women bear over 75% of unpaid work worldwide, irrespective of their contribution to the household income (Woetzel et al. 2015; Chopra and Zambelli 2017). This is mirrored by the effects the COVID-19 pandemic had for women, as employment loss was largely explained by the burden of additional childcare (Fabrizio et al. 2021). Older unemployed women suffer from both age and gender discrimination in their job search (ILO 2022b) and are far less likely than men to reenter the job market (Axelrad et al. 2018). To break the unemployment cycle, governments and employment agencies developed a range of reemployment interventions including vocational training, job search counseling, and subsidized employment (e.g., Croft 2002; Blundell et al. 2004; Felgenhauer et al. 2017; Whelan et al. 2018; Card et al. 2018; OECD 2019).

Existing job counseling offerings are criticized for not meeting the unique situation and needs of older job seekers (AGE 2023). Researchers underpin the

enormous potential of digital technologies to address unemployment of older individuals, while also stressing that this potential so far remains largely untapped (Feuls et al. 2016; Jaarsveld 2020; Klier et al. 2020). Older unemployed individuals often struggle to leverage digital offerings, which is attributed to the "digital divide", i.e., the fact that older people often lack access and skills to make use of new technology (Jaarsveld 2020). As a result, older individuals remain overrepresented among the digitally excluded (Hunsaker and Hargittai 2018; König et al. 2018) and show a lower usage rate of digital public services than younger individuals (Niehaves and Becker 2008; FRA 2023). Research identified various barriers hindering the utilization of digital technologies among older users, for example lack of internet/computer access, worries about costs of usage, lack of skills and knowledge about basic functionalities, and a general negative attitude towards digital technologies (Morris et al. 2007; Yu et al. 2016; Klier et al. 2020). At the same time, studies find that older unemployed individuals are responsive to digital technologies if these consider their specific needs (Klier et al. 2020; Sigler 2021). Older unemployed individuals require specific support features, like a high degree of usability and data security (Klier et al. 2020).

The success of an approach to address unemployment of older individuals can ultimately be measured by its impact on placement success (Liu et al. 2014; Klier et al. 2019). However, placement success can be confounded by external effects, such as the economic climate, and an individual's characteristics, e.g., level of education. Thus, research suggests measures to evaluate interventions, i.e., success indicators predicting reemployment (McQuaid 2006; Klehe et al. 2012; Liu et al. 2014; Sigler 2021). These include job search intensity (Kanfer et al. 2001; Schmidt 2007), job search skills (Wanberg et al. 2002; McQuaid 2006; Liu et al. 2014), and attitude towards job search (Kanfer et al. 2001; Fugate et al. 2004; Liu et al. 2014). Job search intensity indicates the effort devoted to job search activities, such as networking or submitting applications (Kanfer et al. 2001; Schmidt 2007). Job search skills encompass an array of capabilities ranging from CV drafting to presenting oneself at a job interview (Wanberg et al. 2002; McQuaid 2006; Liu et al. 2014). Attitude towards job search captures whether an individual is proactive and has a high self-efficacy level, i.e., the belief in one's capabilities (Fugate et al. 2004). These metrics are relevant when evaluating digital technologies in the context of unemployment. The following section gives an overview of research on digital technologies in the context of unemployment and their relevance for older job seekers.

3 Related work and research gap

The need to modernize and digitalize job counseling for unemployed individuals has attracted significant attention in research and practice (Vehkasalo 2020). Against this background, a branch of research on digital technologies in the context of unemployment has developed, investigating the usage of digital technologies to support people in their quest to become reemployed (Gürtzgen et al. 2021). Research predominantly attributes the potential of digital technologies in the context of unemployment to their online communication features, which are characterized

by accessibility, disinhibition, and written interaction mode (Klier et al. 2020). Accessibility means that unemployed individuals can engage in their job search regardless of time and location (White and Dorman 2001; Cook and Doyle 2002; Coulson 2005). Disinhibition is encouraged through the possibility of anonymous communication, which encourages self-disclosure, for example when seeking advice (Cook and Doyle 2002; Amichai-Hamburger and Furnham 2007; Wildevuur and Simonse 2015). Written interaction mode gives more time for cognitive processing and reflecting on own thoughts when engaging in the job search (Cook and Doyle 2002; Coulson 2005).

Research on digital technologies in the context of unemployment can be categorized into three strands. First, research explores the role of digital technologies for the actual job search. In particular, studies explore how digital technologies change the way in which job seekers are matched with employers (Bagues and Labini 2009). Prior research states that online job seekers, i.e., unemployed individuals who look and apply for jobs via the internet, are substantially more likely to be employed than those only searching offline (e.g., Choi 2023). Leveraging the enormous potential of online job search, researchers investigate digital approaches that support job search such as an online platform where job seekers find tips to improve their search based on their personal data and job market data (Dhia et al. 2022). Other studies address the impact of socioeconomic factors on the use of digital technologies in job search (e.g., McQuaid et al. 2004; Dillahunt et al. 2021). They find that the growing importance of digital technologies bears the risk to leave behind job seekers with less digital affinity, access, and skills (Hecker et al. 2021). Few studies so far deal with the question how older unemployed individuals can leverage digital technologies in their job search, and the results are ambiguous. Briscese et al. (2020) design and evaluate a website providing online job search assistance; they find an increase in employment outcomes only for younger job seekers but not for unemployed individuals older than 50. The authors argue that older unemployed might have limited ability to effectively navigate digital technologies in their job search. In contrast, Klier et al. (2020) suggest that a significant share of unemployed individuals above the age of 50 has access to digital job search technologies and desires more assistance in digital job search. The study by Dillahunt et al. (2021) demonstrates that older job seekers even conduct online job search in a more targeted and goal-oriented manner than younger job seekers. Literature concludes that older unemployed individuals are responsive to digital technologies if interventions are targeted to their specific needs (Sigler 2021).

Second, literature investigates how digital technologies can assist unemployed individuals acquire skills that will help them find a new job (Mian et al. 2022), with a focus on digital training programs (Kuhn and Mansour 2014). Following the COVID-19 pandemic, unemployed individuals even increased their consumption of digital training programs (Le and Aguilar 2023). Mian et al. (2022) provide evidence of the effectiveness of digital training programs on employment outcomes, which were specifically designed for university graduates. Especially during and after the COVID-19 pandemic, massive open online courses (MOOCs) became popular due to their advantages over traditional learning interventions with regards to costs, location, and access (Ariker 2024). The study by

Majerowicz and Zárate (2024) demonstrates the positive effect of MOOCs on employment outcomes. Few studies focus on MOOC design for older unemployed individuals (e.g., Liyanagunawardena and Williams 2016). Targeting older unemployed, Huang and Zhang (2022) propose to simplify the layout, highlight the main content, retain the navigation function, and increase font sizes to effectively reduce their cognitive load and improve their overall experience. Other studies investigate how job search skills can be acquired through digital career counseling (Fieseler et al. 2014; Foster et al. 2014). For instance, Lee et al. (2019) propose a chatbot-based career adviser which provides four levels of service: offering information and recommendations, providing interventions on career development, augmenting career counselors' work, and providing career counseling.

Third, research investigates how digital technologies, first and foremost social media, can help unemployed individuals use social and professional networks for their job search (e.g., Feuls et al. 2014; Garg and Telang 2017). Studies demonstrate that usage of online social networks such as LinkedIn can have a positive effect on unemployed individuals' exposure to potential employers, quantity of professional contacts, job search intensity, and, ultimately, employment outcomes (Garg and Telang 2012, 2017; Laukkarinen 2023). Interestingly, research indicates that unemployed individuals can experience improved mental well-being through social media, however that only applies if they successfully transition the online connections into offline activities (Suphan et al. 2012). It is striking that this process is found to be notably smoother for older individuals, while younger individuals are at risk of feeling more excluded when using social media (Suphan et al. 2012). Nikolaou (2014) shows differences in age when using social media for job search: While older people use LinkedIn more frequently in their job search, younger people rather refer to Facebook. Several researchers underpin the potential of digital peer groups as an important application of social media to foster connection among unemployed individuals (Klier et al. 2019; Sigler 2021). The underlying mechanism of digital peer groups is mutual social support (Vaux 1988; Felgenhauer et al. 2019a, b). Felgenhauer et al. (2019a), for instance, suggest that social support in digital peer groups can help to increase job search self-efficacy. A study investigating digital peer groups for pupils transitioning from school to professional life demonstrates a positive impact on pupils' chances of finding employment while simultaneously improving their attitude toward career choice, career maturity, and career search intensity (Klier et al. 2019). First studies indicate the potential of digital peer groups for older unemployed individuals. With a focus on content and sentiment analysis, Bedué et al. (2020) demonstrate the presence of social support in digital peer groups among older unemployed participants. Results from a pilot study on digital peer groups with 28 unemployed individuals with complex barriers, such as drug addiction or poverty, provide first indication that also older unemployed individuals might benefit with respect to success indicators predicting reemployment, e.g., job search self-efficacy and job search skills (Felgenhauer et al. 2019a). Conducting a case study with 531 subjects, Sigler (2021) finds that older unemployed individuals are indeed accessible for digital job search interventions and can increase their number of job applications and job interview invitations by leveraging digital technologies.

The three strands of research discussed above already include highly insightful and promising studies on digital technologies in the context of unemployment. However, these studies have rarely focused on the group of older unemployed individuals. This gap in the literature is particularly unfortunate given the substantial potential and relevance of this demographic: as outlined in the introduction, unemployment of older individuals is associated with significant societal costs and adverse effects on the individuals themselves (Klehe et al. 2012; Murdock et al. 2021). Despite the often-cited digital divide (e.g., Jaarsveld 2020), recent studies highlight that older individuals respond positively when digital offerings are designed to meet their specific requirements (Xie et al. 2021) and when a clear benefit or need is present (Sixsmith et al. 2022). Initial research even shows that older individuals are willing and able to successfully leverage tailored digital technologies in their job search (Klier et al. 2020; Dillahunt et al. 2021; Sigler 2021). The COVID-19 pandemic, during which many services shifted online, served as an additional catalyst for technology use among older individuals (Xie et al. 2021). Many older individuals adapted their behaviors during the pandemic, increasing their use of digital tools for accessing information, maintaining social inclusion, and communicating (Sixsmith et al. 2022; Xie et al. 2021). Moreover, older unemployed individuals are not only open to using digital technologies but also clearly benefit from digital engagement, which supports their navigation of an increasingly digitalized job search process (Kanfer et al. 2020; Seifert et al. 2020). Through engaging with digital technologies, they can develop digital skills, which are crucial for both job searching and workplace success (Lissitsa et al. 2017; Seifert et al. 2020). Digital skills have become even more important due to the digital transformation driven by the COVID-19 pandemic, which has fundamentally reshaped the job market (Kanfer et al. 2020; Garcia et al. 2021).

In recent years, digital peer support gained prominence as an instrument to foster social support and mental well-being (Suresh et al. 2021). While the positive effects of digital peer groups on younger individuals in the context of unemployment have been well-studied (e.g., Klier et al. 2019), research on their application for older unemployed individuals remains limited. Early findings indicate that designing and studying digital job market interventions—and particularly digital peer group approaches—specifically tailored to this demographic could yield significant benefits (Felgenhauer et al. 2019a). However, to the best of our knowledge, no digital peer group-based approach has been designed specifically for older unemployed individuals, despite their potential to address the unique and pressing challenges faced by this group. Our study seeks to bridge this gap by designing and evaluating a new digital peer group-based approach that can support older job seekers in regaining employment. We thus answer the call for designing interventions that are not only innovative but also aligned with the specific needs of this age group. By doing so, we aim to untap the potential of digital technologies to tackle the problem of unemployment of older individuals.

4 Theoretical background

The design of our approach to address unemployment of older individuals is informed by research on digital peer groups as well as research on social support in peer groups. *Peer groups* are "voluntary, small group structures for mutual aid and the accomplishment of a special purpose. They are usually formed by peers who have come together for mutual assistance in satisfying a common need, overcoming a common handicap or life-disrupting problem, and bringing about desired social and/or personal change" (Katz and Bender 1976, p. 278). Peer groups became famous with Alcoholics Anonymous (AA) in the middle of the twentieth century (Gross 2010). Since then, they have been examined in academic disciplines ranging from psychology to computer science (Agarwal et al. 2009; Barak et al. 2008). The interest in peer groups is driven by the positive effects they have on assisting their members in overcoming or handling a challenging situation (e.g., Agarwal et al. 2009; Mo and Coulson 2012). A peer group effect is defined as "change in the belief, attitude or behavior of a person […] which results from the action or presence [of a peer or group of peers]" (Erchul and Raven 1997, p.138). For instance, a study on a peer group for women with postpartum depression showed a reduction of depression symptoms (Prevatt et al. 2018). Other studies indicated the power of peer groups to facilitate integration in an unfamiliar environment (Wilcox et al. 2005), to increase knowledge (Vedder et al. 2005), or improve quality of life (Cella et al. 1993).

With the proliferation of digital media, the focus of peer group research shifted to *digital* peer groups (Goswami et al. 2010; Klier et al. 2019). *Digital peer groups* allow participants to interact via computers or mobile communication networks (Coulson 2013; Holbrey and Coulson 2013; Houston et al. 2002). Surprisingly, research suggests that digital interaction can even reinforce peer groups' effectiveness (Klier et al. 2019). Indeed, despite lacking face-to-face interaction, there are certain advantages of digital peer groups, which reflect the advantages of online communication discussed above: they can be accessed without time and place constraints (van Uden-Kraan et al. 2009; Coulson 2013). Participants can interact anonymously, thus being encouraged to share opinions or disclose sensitive information (Finfgeld 2000; van Uden-Kraan et al. 2008). Digital interaction allows members to "lurk", i.e., silently observe without commenting, but still benefitting from the shared information (Finfgeld 2000), which can be especially relevant for older individuals who might need some time to become familiar with digital communication. The asynchronous interaction mode facilitated by digital media further allows time to reflect on a statement before answering (Coulson 2013).

Literature proposes the occurrence of *social support*, i.e., the assistance given and received (Vaux 1988), to be the theoretical foundation of (digital) peer groups' success (e.g., Coulson et al. 2007; Goh et al. 2007; Mo and Coulson 2012). For instance, peers of Alcoholics Anonymous might give each other hope by sharing mutual experiences (Gross 2010). Social support in peer groups has been analyzed in contexts like health, for example cancer (e.g., Sullivan 2003;

Vilhauer 2009), HIV/AIDS (e.g., Coursaris and Liu 2009; Guo and Goh 2014), Parkinson's disease (e.g., Attard and Coulson 2012), chronic diseases (e.g., van Uden-Kraan et al. 2008; Holbrey and Coulson 2013), and mental health (e.g., Evans et al. 2012; Prevatt et al. 2018). Social support was further shown in other domains such as parenting (e.g., Dunham et al. 1998; Drentea and Moren-Cross 2005) and caregiving (e.g., Mohd Roffeei et al. 2015; Perron 2002). Research indicates that social support varies across the lifespan: For younger individuals, social support has a stronger effect in reducing depression and loneliness (Segrin 2003). Younger individuals tend to rely on social support from a variety of sources to maintain well-being, while older individuals mainly rely on social support from close persons (Segrin 2003). Still, research has demonstrated positive effects of social support on older individuals, for instance, regarding the decrease in depression symptoms (Vanderhorst and McLaren 2005; Mohd et al. 2019). In the context of unemployment, social support has been demonstrated to be crucial for all age groups, both offline and in digital contexts (e.g., Rife 1992; Felgenhauer et al. 2019b). For younger unemployed individuals, its importance has been well-researched and documented (Klier et al. 2019). For older individuals, prior research shows that the need for social support increases due to life events involving loss, such as job loss (Bui et al. 2020; Machielse and Duyndam 2020). While the importance of social support for older unemployed individuals is evident, the effect of social support on older unemployed individuals remains understudied. First studies indicate its potential importance in alleviating challenges associated with unemployment of older individuals, especially in digital contexts (Felgenhauer et al. 2019a).

Five types of social support are commonly distinguished: *informational support*, *emotional support*, *esteem support*, *network support*, and *tangible assistance* (Cutrona and Suhr 1992). *Informational support* refers to the provision of information or advice (Coulson et al. 2007), which can encompass facts (Coulson 2013), as well as experiences (Coulson et al. 2007), personal advice, referral to experts, situation appraisal and teaching (Braithwaite et al. 1999; Coursaris and Liu 2009). Participants in peer groups receive informational support from both peers and experts by asking questions, receiving answers, or silently observing the conversation (Finfgeld 2000; Coulson et al. 2007; Liou et al. 2016). Older unemployed individuals often face challenges in accessing relevant information online due to a lack of digital skills compared to their younger counterparts (Sixsmith et al. 2022). Thus, informational support in digital peer support can be particularly valuable, offering guidance and assistance that helps mitigate these barriers.

Emotional support is the communication of love, concern, or empathy (Coulson et al. 2007) and involves conveying understanding and solidarity to a peer's circumstances and experiences (Finn 1999; Coursaris and Liu 2009). In (digital) peer groups, members provide emotional support by disclosing their challenging situations, revealing similar mistakes or expressing regret and concern for the situation of others (Braithwaite et al. 1999; Coulson et al. 2007; Holbrey and Coulson 2013). They show their understanding and affection for other participants and create meaningful connections (Coulson et al. 2007; Coursaris and Liu 2009; Weinberg et al. 1996). Research shows that the amount of emotional support given and received

decreases as age increases (Keyes 2002). Simultaneously, studies emphasize the critical role of emotional support in promoting the well-being of older adults (Patrick et al. 2021). Thus, emotional support in digital peer groups is especially relevant for older individuals navigating the experience of job loss.

The communication of respect and confidence in abilities is called *esteem support* (Coulson et al. 2007) and aims to validate the recipients' feeling of self-concept, competence and importance (Braithwaite et al. 1999; Coulson et al. 2007; Felgenhauer et al. 2019a). It includes three dimensions: (a) compliment: positive messages about a member, (b) validation: messages that express agreement, acknowledgement and appreciation, and (c) relief of blame: alleviating guilt (Coursaris and Liu 2009). Unemployment has been shown to have a negative impact on self-esteem, especially for older individuals (Whitley and Popham 2017), which underpins the potential of esteem support in digital peer groups for older unemployed individuals.

Network support is the communication of belonging (Coulson et al. 2007; Coursaris and Liu 2009) and is distinguished into (a) access to new contacts, (b) presence of listeners, and (c) connection to companions with similar interests and experiences. It accentuates the feeling of not being alone (Finn 1999; Coulson et al. 2007; Gaysynsky et al. 2015) and encourages members to build trust, identify similarities and deal with their peers' problems (Braithwaite et al. 1999; Felgenhauer et al. 2019a). Network support is especially important for unemployed individuals who have lost their workplace networks. For older individuals, who tend to have smaller social networks compared to younger peers (Tang and Lee 2011; Weijs-Perrée et al. 2015; Kemperman et al. 2019), network support received through digital peer groups may be especially relevant.

Finally, *tangible assistance* describes offering concrete action of support (Coulson et al. 2007; Gaysynsky et al. 2015), including performing a task directly or loaning goods (Braithwaite et al. 1999; Coursaris and Liu 2009; Gaysynsky et al. 2015; Felgenhauer et al. 2019a). In digital peer groups, tangible assistance has not been often observed (Gaysynsky et al. 2015; Felgenhauer et al. 2019a).

5 Design of a novel digital peer group-based job counseling approach for older unemployed individuals

We propose a digital peer group-based job counseling approach to assist older unemployed individuals in regaining employment. Traditionally, job counseling for those people is one-on-one between a professional job counselor and an individual. It includes professional support on career development, job search, applications, and interviews. Moreover, it is characterized by a regular interaction mode and face-to-face meetings. Restrictions related with the COVID-19 pandemic directly concern job counseling, as face-to-face meetings often had to be replaced, for instance by telephone appointments. This made interaction and the provision of support more difficult (OECD 2022).

Our digital peer group-based job counseling approach ("Digital Peers") supplements the traditional one-on-one (1:1) offline counseling with a digital peer group (n:n). We thereby tread a new path in information systems literature by digitally

Table 1 Design decisions

Design decision	Concretization (considerations for older individuals)	Source
Design decision 1: Target unemployed over 50	Participants are unemployed individuals above the age of 50 (older individuals demonstrate advantages from specialized social support)	Gray (1983), Rife (1992), Boockmann and Brändle (2015) and Liu et al. (2014)
Design decision 2: Realize small group sizes	Small groups with 15–30 participants (accounts for older individuals being overrepresented in "lurkers")	Barak et al. (2008), Liamputtong et al. (2016) and Felgenhauer et al. (2019a)
Design decision 3: Implement peer groups in online messenger	Implementation through online messenger application (suitable across age groups, though research supports hypothesis that older individuals especially benefit from online interaction)	Barak et al. (2008), Goswami et al. (2010) and Coulson (2013)
Design decision 4: Establish moderation	Moderation by at least one expert (no specific consideration for older individuals)	White and Dorman (2001) and Coulson (2013)
Design decision 5: Implement technical features for successful digital exchange	Low barrier participation options Asynchronous and written interaction Possibility to exchange documents Possibility to directly address specific peers Opportunity to remain anonymous Use of emoticons to foster emotional support (recommended across age groups, specific adjustments for older individuals who seek to access the group via computer)	Hrastinski (2008), Bender et al. (2013), Robinson et al. (2016), Bröhl et al. (2018) and Gallud et al. (2018)

providing peer support for unemployed older individuals. Based on literature, we derived five design decisions for the artifact (cf. Table 1).

First, we designed digital peer groups exclusively for older unemployed individuals, recognizing this demographic's need for a tailored digital intervention. This age group demonstrates distinct advantages from specialized (digital) social support, as shown in previous studies (Liu et al. 2014; Boockmann and Brändle 2015). Our design choice of developing a group that exclusively targets members above the age of 50 incorporates these findings. Although older unemployed individuals may experience diverse circumstances, they share a commonality: confronting unemployment in later stages of life, a defining characteristic among peers in our study. Specifically, they encounter comparable needs and challenges, distinct from those faced by younger unemployed individuals (e.g., Gray 1983; Rife 1992). This is highlighted by the fact that long-term unemployment is more likely for older than for younger unemployed people (Gray 1983). Older individuals also more often than younger people work in industries which are becoming obsolete, and thus likely lack skills currently sought-after on the job market (Gray 1983). Finally, job discrimination based on age is widespread and unemployment at an advanced age oftentimes leads to early retirement (Baker 2017). We assume that a peer group exclusively for individuals above the age of 50 allows for more targeted provision of informational support, with information relevant for this demographic. Literature on digital peer groups suggests that peers with similar issues may more easily identify with the group (Barak et al. 2008), enhancing the foundation for emotional and esteem support as individuals identify more strongly with a peer's circumstances. Moreover, this enhances understanding and social comparison among peers, which helps them to reappraise their own situation (Agarwal et al. 2009; Coulson 2013; Jabr et al. 2014; Brown and Pehrson 2019).

Second, we designed our digital peer group with a minimum and maximum group size, i.e., 15–30 participants. We chose to build small peer groups with each group consisting of at most 30 people as restricting the group size to this magnitude has recently been proven to be effective in other digital peer group formats (Liamputtong et al. 2016; Felgenhauer et al. 2019a). A small group size might be especially beneficial for older individuals, which tend to rely on social support from rather close persons compared to younger individuals, who rely on social support from a variety of sources (Segrin 2003). Indeed, smaller group sizes particularly create a trusting and intimate environment and foster the development of group identity (Barak et al. 2008) and likely lead to stronger emotional and network support amongst the group members. This might be especially true for older individuals, who may not be familiar with online communities and could easily feel overwhelmed (Braun 2013). The group size limitation can also help elevate esteem support, as more opportunities for compliments and validation arise in a smaller group, compared to a larger setting. In job clubs, as an offline peer group intervention in the context of employment, group sizes of only 10 participants are even recommended (Azrin et al. 1975; Gray 1983). However, research suggests that 25% of users of online peer groups are low contributors (Förster 2021) and that older individuals are overrepresented in "lurkers" in online support groups (van Uden-Kraan et al. 2008). To take this tendency of our cohort into account, we set the minimum size to 15, aiming to ensure more vivid

discussions that generate sufficient contributions for informational or even tangible support.

Third, we decided to implement the peer group through an online messenger application, exploiting the potential of digital technologies for older unemployed people. Through online applications, users can both provide and receive support (Barak et al. 2008), while ensuring flexible access to mutual support from anywhere and at any time (e.g., Coulson 2013; Goswami et al. 2010). On the one hand, this provides peer group members with the opportunity for a regular interaction mode and easy integration into everyday life. Older unemployed individuals might especially benefit from this, as they both value a regular structure (Neuberg and Newsom 1993; Rife and Belcher 1994) as well as flexibility due to commitments with regards to their family life. In addition, we expect older individuals to receive strong emotional support in a virtual setting, given the finding that this age group can successfully translate online interactions into personal relationships (Suphan et al. 2012). On the other hand, constant access to information and support from the group (Goh et al. 2016) is especially crucial for the well-being of older individuals, who face a higher risk of social exclusion (Goswami et al. 2010). They can use the messenger to ask for support whenever they need informational support or tangible assistance, for example with questions regarding a time-critical application, or before an interview that is conducted via video conference technologies they do not yet have worked with. Moreover, constant access to job search-related support might frequently remind older unemployed people of their own job search. Thus, they might be inspired by the job search efforts of others, fostering both their job search intensity and job search skills. Furthermore, using a mobile messaging application might promote crucial digital skills. Given the increasing importance of digital skills in the job market (van Laar et al. 2017) as well as the fact that unemployed older individuals are more likely to lack these skills than younger unemployed (Tisch 2015; OECD 2019) and as employed people (van Deursen and van Dijk 2014), our target group might particularly benefit from using this technology. It is not expected that financial limitations might inhibit people from participating in the online group as most adults in developed countries have access to mobile and computer technologies, independently of age, social status, origin, and job (Shaw et al. 2016).

Fourth, each digital peer group was assigned a moderator in order to improve the quality and credibility of information and prevent the spread of false or unreliable information (Coulson 2013) as well as mobbing (White and Dorman 2001). The moderator's main tasks included sharing job market information targeted for older unemployed individuals, such as job offers, training opportunities and job fairs, sharing concrete job-seeking advice, such as tips for job applications and interviews, motivating group members to support one another, and answering specialized questions. This way, the moderator's support and knowledge supplements the peer support and experience, providing informational and tangible support, which is especially relevant for older unemployed individuals who, as outlined above, are disadvantaged on the job market (e.g., Tisch 2015) and in need of advice, relevant information, and concrete support (Tisch 2015; Sixsmith et al. 2022). Moreover, an administrator account provided the participants with organizational information. For technical support, the users could write to an official mailbox.

Fifth, we designed the messenger application with several technical features aimed at ensuring it was accessible and easy to navigate for older unemployed individuals. The messenger application can be accessed via mobile and computer devices, as among older individuals, not all prefer using a smartphone (Bröhl et al. 2018; Mohadis and Ali 2014). Therefore, users can choose their favorite means of access, which is setting a low threshold for participation (Tams et al. 2022) and facilitating the exchange of tangible support, e.g., sharing a CV that is stored on a computer device. Moreover, the messenger provides a written, asynchronous communication mode. Different than with synchronous technology, communication in our digital peer group is time-delayed, i.e., participants can read and answer messages at any time. This allows for additional flexibility, as participants can review older information when needed (Bender et al. 2013; Hrastinski 2008). Asynchronous technologies further foster group identity as they allow more thoughtful responses to sensitive issues (Hrastinski 2008; Dennis et al. 2008), which is especially important for sharing esteem support when discussing the difficult experience of losing employment at an advanced age (Klehe et al. 2012; Murdock et al. 2021). Studies show that not having to provide an immediate reaction can have a disinhibiting effect (Barak et al. 2008). For older individuals, who might be less tech-savvy than their younger peers (Jaarsveld 2020), the opportunity to post messages and answers at any time can remove pressure and participation barriers for the provision of informational support. The written interaction mode allows to exchange links, documents, and other forms of media. This crucial for the exchange of informational support by, e.g., enabling participants to provide feedback for a cover letter. To better structure the open discussion, our messenger allows users to address specific peers by adding "@ Nickname" and reply to certain messages, however, in the spirit of peer support, all messages are available to all members. To ease sharing of feelings and emotional support, the messenger offers emoticons (Hrastinski 2008), which have also been found to be frequently used in chats by older people (Gallud et al. 2018). Emoticons help convey the emotional intent of a message, thereby enhancing trust and fostering the perception of emotional support in digital environments (Derks et al. 2008). Finally, the messenger allows peers to stay anonymous, as they join the messenger with a randomly assigned identification number, which they can edit if they want. This serves to provide an intimate environment and facilitate the discussion of sensitive issues common to digital peer groups (Robinson et al. 2016), as well as provision of emotional and esteem support. This is particularly important given the high emotional burden of unemployment in individuals above the age of 50 (Klehe et al. 2012; Murdock et al. 2021).

Following these decisions, we designed the IT artifact "Digital Peers" as a messenger for unemployed older individuals. The artifact is characterized by peer support in small groups, online implementation with access via mobile and computer devices, the option to exchange messages, links and other forms of media, asynchronous communication, anonymous exchange, and professional moderation. Figure 1 illustrates the implementation of the design decisions based on an exemplary chat.

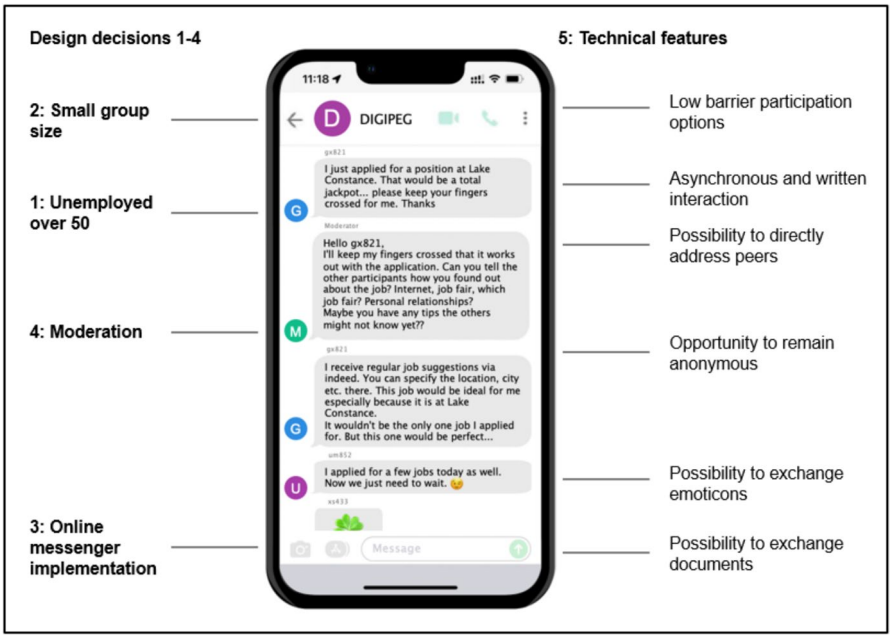

Fig. 1 Implementation of design decisions illustrated using an exemplary chat

6 Demonstration and evaluation

We aim to demonstrate the practical applicability and evaluate the efficacy of our proposed artifact (Hevner et al. 2004; Gregor and Hevner 2013). We demonstrate practical applicability by instantiating our artifact in a real-world setting in collaboration with the German Federal Employment Agency in the state of Baden-Wuerttemberg. We evaluate its efficacy in a field experiment, investigating its impact on reemployment and indicators predicting reemployment of older unemployed individuals. In the following, we describe the setting, followed by the demonstration and evaluation.

6.1 Setting

Demonstration and evaluation were conducted in collaboration with the German Federal Employment Agency (Bundesagentur für Arbeit) in the state of Baden-Wuerttemberg. The German Federal Employment Agency has about 96,000 employees, 155 employment agencies and roughly 600 branch offices, serving citizens, companies, and institutions. Services include financial support during unemployment, job counseling and job placement. As part of their established process, the agencies provide one-on-one counseling for unemployed individuals. Each unemployed individual is served by one designated counselor. Before the start of

the COVID-19 pandemic face-to-face meetings took place on a regular basis, for example once a month. Topics discussed in the counseling sessions include career development, job search, applications, interview preparation, and personal challenges. Instantiating our artifact implies supplementing this service with digital peer groups for older unemployed individuals, implemented through an online messaging application.

6.2 Demonstration

To demonstrate practical applicability of our artifact, we first describe how we instantiated it in the given real-world setting. Second, we demonstrate how the artifact was used (Peffers et al. 2007).

6.2.1 Instantiation of the artifact

To instantiate our artifact for older unemployed individuals in the state of Baden-Wuerttemberg, we supplemented the existing service provided by employment agencies with digital peer groups. We realized digital peer groups via an online messenger application. It was implemented using the free and open-source instant messaging client Element with the open standard communication protocol Matrix. The messenger was centrally hosted on our own server. The access data for the messenger was shared with the participants through the Federal Employment Agency, adhering to highest data protection standards. Access was granted through a two-step-process: On the project website the participants could enter the access data they had previously obtained from the Employment Agency. Subsequently, they received an anonymous ID for registration in the messenger. All settings, like specific participants rights and access to groups, were centrally administered for all accounts. This implementation was chosen as it enabled us to meet the design decisions outlined before: First, we created a messenger with several unique chat groups suited for our target group, people sharing the challenge of being unemployed and over the age of 50. Thus, it was important to design an app that follows the needs of this group. This was done through a human-centered design, incorporating insights on the specific needs of elderly users, especially a high degree of usability as well as easy access and interaction (Al-Razgan et al. 2012; Klier et al. 2020). Second, as all identified participants received an anonymous ID via a central website, we were able to invite them to their respective peer group and implement the planned small group sizes (between 15 and 30 participants). Third, following our design decisions, the implementation allowed peer group members permanent and flexible access to the chat group and the opportunity to improve their digital skills (e.g., Coulson 2013; Goswami et al. 2010). Fourth, the technical implementation enabled us to realize all features of the messenger. The messenger could be installed on all mobile devices, as well as accessed from a desktop computer (Mohadis and Ali 2014; Bröhl et al. 2018). It allowed for written, asynchronous communication (Hrastinski 2008; Bender et al. 2013) and gave participants

the opportunity to address each other and reply directly to previous messages. However, all messages were visible to all members. Participants could also send emoticons, documents, and pictures (Hrastinski 2008; Gallud et al. 2018). The messenger also allowed for high data security standards through end-to-end encryption and storage of the data on our local server, as well as anonymity: Within the digital peer groups, all individuals remained anonymous while having a unique identification code. The participants had the opportunity to change their nickname to a more personalized yet still anonymous name. This way, our application fulfilled all technical requirements: It allowed to exchange support through text messages, shared documents, emoticons, and pictures and ensured a high level of data security and anonymity. Fifth, the moderators received the same access rights and features as the participants. They were assigned to their respective chat groups with their anonymous ID, which they could change into "Moderator". To be able to moderate the chat groups during their regular working hours and on their work computers, they could access the chat via the desktop version. At least one employment counselor supervised each digital peer group. To help the counselors in complex moderation situations, we formed a mentoring group using the same messaging application. We instantiated 27 digital peer groups for 506 unemployed individuals in the state of Baden-Wuerttemberg. In each digital peer group, 15–30 unemployed individuals supported one another via chats moderated by the professional counselors over a period of three months, in addition to receiving traditional job counseling by their respective employment agency.

6.2.2 Usage of the artifact

To demonstrate how the artifact can be used, we analyzed the chat data of the 27 digital peer groups, which comprises all messages including text, emoticons, and files as well as metadata including identification number of the writer and time stamps. Messages sent by unemployed older individuals in the 27 digital peer groups sum up to 4449 messages. One older unemployed individual sent on average 8.8 messages in their digital peer group. Building on previous studies in this context (e.g., Felgenhauer et al. 2019b), we applied content analysis (Krippendorff 2004) utilizing the Social Support Behavior Code (Cutrona and Suhr 1992) to identify social support in these messages. Three researchers coded the messages independently from each other and discussed coding disagreements to reach consent. Messages could be coded as containing one or more types of social support, i.e., informational support, emotional support, esteem support, network support, and tangible assistance. Interrater reliability measured by Fleiss' Kappa was 0.73—"substantial agreement" (Landis and Koch 1977, p. 165). We found 4914 expressions of social support in the 4449 messages. Older unemployed individuals mainly used the digital peer groups to exchange messages containing informational support, followed by esteem support, emotional support, network support and, lastly, tangible assistance. Table 2 illustrates the types of social support exchanged in our digital peer groups with concrete example messages from the chats. Social support was exchanged on issues such as personal employment goals, age-related problems to become reemployed,

Table 2 Social support exchanged in the instantiated digital peer groups

Social support type	Number of messages	Example messages (translated from German)
Informational support	3,131	"I also really like to use meinestadt.de/jobs. When I find something interesting there, I search for the job again directly on the company's homepage. This is because, in the 'Careers' section, companies are increasingly offering the option to apply directly online." "Laptops usually have a built-in microphone. A headset from your phone is also a good alternative for both the microphone and speakers. As previously emphasized, pay attention to your background." "I created my own resume and saved the document (in PDF format) in the 'Documents' section, along with certificates and other attachments. Please note that it's a good idea to optimize PDFs using programs like Pdf24 to reduce their size. The upload limit for documents is often very restricted (3MB). Another tip: chain your certificates together and compress them into a single PDF."
Emotional support	167	"I'm sorry, keep your head up, and keep going. I also got a reply to an application today; they said they need to review it first." "Don't give up. Eventually, you'll find the needle in the haystack." "I'm sorry to hear about your depression. Hopefully, you're getting treatment. There are good antidepressants available these days. Exercise can also help because it releases endorphins. Unfortunately, this illness is becoming more common in our cutthroat society."
Esteem support	1592	"Congratulations 👍" "Wonderful, wishing you lots of success 🍀" "You're really brave with so many applications! 😔 I think mushroom foraging is a great way to find balance, and it's incredibly courageous of you to write so honestly!"
Network support	107	"I'm registered with various recruitment agencies—there's always plenty of interest, but nothing concrete so far. However, like nq303, I'll keep trying to find a new role—because we're simply worth it!" "Of course, age is a decisive factor. That's exactly why we now have this project to help us move forward 😊" "Thank you for sharing with us 😲 Yes, we all know those feelings, especially in our situation."
Tangible assistance	24	"Well, since we're all looking anyway, we could also look out for each other! That's what I've done with my friends and acquaintances, and it worked out great. Both of them got a job. If we know what each person is looking for or which direction they want to go, we can support one another. While searching for ourselves, we might come across a position that could be a good fit for someone else and let them know." "Good morning, my suggestion is to first practice the technical aspects. In the first part, each participant could host a session and the others would join—once on Skype and once on Zoom. Then, we could go through the technical features (screen sharing, speaker view, whiteboard) and provide feedback to each other on lighting, camera, and sound quality. Once we've achieved a professional appearance, we could move on to the second step: simulating an interview. Who would be interested in participating?"

professional and personal challenges with regards to the COVID-19 pandemic, writing and submitting applications, preparation for (online) interviews, and possibilities and plans for further education. The professional counselors fulfilled their expected

role to launch discussions, include professional recommendations, answer specific questions, and share information on websites or events.

6.3 Evaluation

We performed a summative and naturalistic evaluation of our artifact according to the Framework for Evaluation in Design Science (FEDS) (Venable et al. 2016). We evaluated the artifact's efficacy in a randomized field experiment with a treatment group and a control group in the given real-world setting, investigating its impact on reemployment as well as on indicators predicting reemployment of older unemployed individuals. The focus of our evaluation is on overall efficacy; however, we also provide first insights into when and for whom the artifact is particularly effective.

6.3.1 Experimental design

The field experiment was conducted in three phases (Fig. 2). During Phase I, we selected the participants, randomly assigned them to the treatment or control group and asked all of them to complete a pre-survey. In Phase II, the treatment group was exposed to our artifact as described in Sect. 6.2, while the control group kept receiving only traditional one-on-one counseling. In Phase III, a post-survey among all participants was conducted.

6.3.2 Participants

For the field experiment, unemployed older individuals aged 50–65 were recruited through their respective employment agency. Career counselors approached unemployed individuals from the target group (aged 50–65). If they volunteered to participate, they received the link for the pre-survey and, in case of the treatment group, to sign up for the messenger. The only selection criterium was age, apart from that the profiles of the participants differed. The unemployed individuals were from different regions in Baden-Wuerttemberg, both urban and rural. They came from different backgrounds in terms of education and duration of unemployment. Chats were organized by assignment to local employment agencies, as shared content, such as

Group	Phase I	Phase II	Phase III
Digital peer group-based job counseling *(Treatment group)*	S_1	T	S_2
Traditional job counseling *(Control group)*	S_1	No	S_2

Where S_t = Survey at different points in time (t) T = Treatment

Fig. 2 Experimental design

information about job offers, can regionally differ. Thus, the members of one chat group lived in the same region.

987 participants from 15 agencies took part in the field experiment, 506 in the treatment group (27 chats) and 481 in the control group. The focus of our evaluation was on overall efficacy, implying comparison between the treatment and the control group. However, we also sought to provide first insights into when and for whom the artifact is particularly effective. During the field experiment, the global COVID-19-pandemic started in March 2020 (first contact restrictions in place in Germany) with tremendous impact on the job market. From the total 27 digital peer groups, we distinguished between participants from the 11 digital peer groups that ended before March 2020 (pre-Corona) and participants that took place in one of the 16 digital peer groups during the COVID-19 job market crisis (during-Corona). We also distinguished between male and female participants who face different conditions on the job market. Literature demonstrates different labor market prospects for women compared to men (Lundborg et al. 2017), and the COVID-19 pandemic has even deepened many of the existing gender inequalities (Yavorsky et al. 2021). Sociodemographic data indicates that in our study assignment to treatment and control group differed among men and women (Chi-square test, $p < 0.05$). Thus, analyzing when and for whom the artifact is particularly effective, the 987 participants were split in four subgroups: *women pre-Corona* (164 participants), *women during-Corona* (238 participants), *men pre-Corona* (219 participants), and *women during-Corona* (366 participants). Table 3 gives an overview of the sociodemographic characteristics of the participants. Comparison of the subgroups according to ANOVA-tests indicate significant differences regarding *professional qualification or university degree* ($p < 0.05$), but not in *age* and *duration of unemployment*. In line with the educational situation in Germany, we observe a higher proportion of men with a professional qualification or university degree (89%) compared to women (83%).

6.3.3 Data collection and measurement

During the experiment, we collected two datasets: (1) data on job placement success, i.e., the change in job status from unemployed to employed, recorded by the agencies, (2) survey data from the pre- and post-surveys.

To analyze the artifact's impact on reemployment, the agencies collected data on placement success from all participants. The anonymized data included data on employment status at times S_1 (prior to start of the chat) and S_2 (after end of the chat). Of the 987 participants, data on employment status was available at S_1 and S_2 for 973 participants, 500 from the treatment and 473 from the control group. The agencies also collected data on gender, age, duration of unemployment and on whether the participants had obtained a professional qualification or university degree in the past.

We collected survey data from the pre- and post-surveys on success indicators predicting reemployment. Data was collected at S_1 and S_2 and depict the development of participants regarding success indicators predicting reemployment. Success indicators comprise job search intensity, job search skills, and attitude towards job search. To operationalize the success indicators job search intensity and job search

Table 3 Sociodemographic characteristics of participants by group affiliation

Group	Number of participants	Age	Duration of unemployment (months)	Professional qualification or university degree		Gender	
	N	Mean (*sd*)	Mean (*sd*)	Yes (%)	No (%)	Male (%)	Female (%)
Treatment group	506	56.16 (*3.54*)	7.14 (*5.58*)	437 (*86%*)	69 (*14%*)	310 (*61%*)	196 (*39%*)
Control group	481	56.75 (*3.63*)	7.20 (*6.26*)	417 (*87%*)	64 (*13%*)	275 (*57%*)	206 (*43%*)
Women pre-Corona	164	56.34 *(3.76)*	6.78 *(5.77)*	138 *(84%)*	26 *(16%)*		
Women during-Corona	238	56.04 *(3.55)*	6.6 *(6.08)*	194 *(82%)*	44 *(18%)*		
Men pre-Corona	219	56.67 *(3.63)*	7.73 *(6.24)*	193 *(88%)*	26 *(12%)*		
Men during-Corona	366	56.63 *(3.5)*	7.38 *(5.65)*	329 *(90%)*	37 *(10%)*		

skills, we used established survey constructs on employment interventions (Schmidt 2007; Klier et al. 2019). To measure constructs on attitude towards job search, we employed standards questionnaires (Jerusalem and Schwarzer 1992; Schmitz and Schwarzer 1999). The comprehensibility of the survey items was validated with the professional counselors at the agencies. Constructs were measured using a Likert-type scale ranged from 1 ("strongly disagree") to 6 ("strongly agree"). For Likert-type scales with multiple items, the average of a construct's items was calculated. For nominal scales, the sum of a construct's items was realized. Table 4 provides an overview of constructs. Of the 987 participants, 423 took part in the pre- and post-survey, 211 from the treatment and 213 from the control group.

6.3.4 Analysis and results

We aimed to assess the efficacy of our digital peer group-based counseling approach. To this end, we compared the development of the treatment group with that of the control group by means of one-tailed Mann–Whitney U tests (MWU tests) with respect to reemployment (placement success) and success indicators predicting reemployment (job search intensity, job search skills, attitude towards job search). Table 5 gives an overview of the results.

Regarding overall efficacy, the results suggest that digital peer groups have a positive effect on success indicators predicting reemployment: Participation in digital peer groups enhances job search intensity and job search skills. In our field experiment, the treatment group developed significantly better than the control group regarding the number of distinct application activities $(p < 0.1)$, number of applications (within the last three months) $(p < 0.1)$, written application skills $(p < 0.05)$, interview application skills $(p < 0.01)$, and job search clarity $(p < 0.1)$. Our results do not suggest an effect of digital peer groups on constructs linked to participants' attitudes towards job search.

Considering the tremendous impact of the global COVID-19-pandemic on the job market and considering the different conditions women and men face on the job market, we further analyzed the impact of participation in the digital peer group for four distinctive subgroups: *women pre-Corona*, *women during-Corona*, *men pre-Corona* and *men during-Corona*. This analysis provides two additional interesting insights into when and for whom our artifact is particularly effective. First, we find a direct effect of digital peer groups on placement success for older unemployed women who find themselves in the job market crisis during the COVID-19 pandemic. Among *women during-Corona*, the treatment group developed significantly better than the control group with respect to employment status $(p < 0.05)$. While this direct effect on placement success can only be observed for *women during-Corona*, the other subgroups also increased their reemployment chances through higher job search intensity and better job search skills. Second, we find that participants especially benefitted from improved written and interview application skills before the job market crisis started and, in contrast, from improved job search clarity during the crisis. Only for the subgroups *women during-Corona* and *men during-Corona*, the treatment group developed significantly better than the control group with respect to job search clarity *(women during-Corona*: $p < 0.05$, *men during-Corona:*

Table 4 Success indicators predicting reemployment

Success indicator	Construct	Items	Scale	Source
Job search intensity	Number of distinct job search activities	15	Nominal scale depicting job search activities (e.g., "Create application dossier")	Schmidt (2007)
	Number of applications *(within last 3 months)*	1	Free input on number of applications	Klier et al. (2019)
	Number of invitations to job interviews *(within last 3 months)*	1	Free input on number of invitations	Klier et al. (2019)
Job search skills	Written application skills	4	6-point Likert-type scale	Schmidt (2007)
	Interview application skills	2	6-point Likert-type scale	Schmidt (2007)
	Job search clarity	4	6-point Likert-type scale	Schmidt (2007)
Attitude towards job search	Proactive attitude	8	6-point Likert-type scale	Schmitz and Schwarzer (1999)
	Self-efficacy	10	6-point Likert-type scale	Jerusalem and Schwarzer (1992)

Table 5 Results of group comparisons (Z-statistics to Mann–Whitney U tests) between treatment group and control group

	Construct	Z-statistic				
		All participants	Women pre-Corona	Women during-Corona	Men pre-Corona	Men during-Corona
Placement success	Employment status at the time of the study	0.68	0.52	**1.86****	− 1.22	0.03
Success indicators predicting reemployment						
Job search intensity	Number of distinct application activities	**1.82***	1.25	0.03	**2.08****	0.33
	Number of applications (within the last three months)	**1.78***	0.87	− 0.54	**1.42***	**1.91****
	Number of invitations to job interviews (within the last three months)	1.33	**1.34***	0.24	1.01	0.44
Job search skills	Written application skills	**2.49****	**1.92****	0.20	0.88	1.26
	Interview application skills	**2.92*****	**1.63****	1.00	**2.40*****	1.05
	Job search clarity	**1.88***	0.61	**1.30****	0.45	**1.42***
Attitude towards job search	Proactive attitude	− 0.59	− 0.06	0.39	0.11	− 1.14
	Self-efficacy	0.53	− 0.19	0.91	− 0.42	0.70

A positive Z-score means a higher value of the treatment group compared to the control group and vice versa

Significant results are highlighted in bold

*p < 0.1; **p < 0.05; ***p < 0.01

p < 0.1), while for the other subgroups, the treatment group developed significantly better than the control group with respect to written application skills *(women pre-Corona*: *p < 0.05)* and interview application skills *(women pre-Corona*: *p < 0.05, men pre-Corona: p < 0.01)*.

7 Discussion

7.1 Theoretical and practical implications

Our research was motivated by the severe problem of unemployment of older individuals, which has severe consequences for both the affected individuals and society as a whole. Building on prior research on digital technologies in the context of unemployment and social support in digital peer groups, we are the first to propose a digital peer group-based job counseling approach for older unemployed individuals. We demonstrated the practical applicability and evaluated the efficacy of our approach in collaboration with the German Federal Employment Agency. The study contributes to theory and practice in several ways:

Our findings provide empirical evidence that our novel digital peer group-based job counseling approach assists older unemployed individuals to regain employment. We thereby expand existing literature, which suggests that older job seekers lag behind in the usage of digital technologies (Jaarsveld 2020) and, at the same time, underlines the potential of digital technologies to address the unemployment of older individuals (Klier et al. 2020; Sigler 2021). Our study provides evidence that digital peer groups can increase reemployment chances of older individuals by enhancing their job search skills as well as job search intensity. More precisely, group comparisons using Mann–Whitney U tests between the treatment group and the control group revealed significant effects on *written application skills*, *interview application skills*, and *job search clarity*, as well as on *number of distinct application activities* and *number of applications*. Therefore, the design of our digital peer group-based approach showcases how digital technologies can meet the specific needs of older unemployed individuals. Beyond, we extend literature on digital peer groups (e.g., Felgenhauer et al. 2019a; Klier et al. 2020; Sigler 2021) by evaluating their effectiveness for the target group older unemployed individuals in a large-scale field experiment with 987 participants. Our results regarding job search intensity and job search skills confirm the effectiveness of digital peer groups on activation and pertinent skills acquisition, which has so far been shown for youths, to be valid for older individuals (Klier et al. 2019). These indicators are particularly important in the case of older individuals, as lower job search intensity partly explains diminished reemployment chances in older individuals (Vansteenkiste et al. 2015). Likewise, the group of older, unemployed individuals is expected to lack job search skills (Tisch 2015). Surprisingly, our results suggest that for older individuals, in contrast to youths (Klier et al. 2019), no impact of digital peer groups on their attitude towards job search can be expected. Together with the insights from prior research, our study provides strong evidence that digital peer groups are effective in combating unemployment for older unemployed individuals.

Beyond demonstrating overall efficacy of the proposed digital peer group-based approach, our evaluation provides initial insights into when and for whom our artifact is particularly effective. Our study revealed that gender and job market situation are important contextual factors for the effectiveness of the digital peer group-based approach.

One the one hand, we find that both older unemployed women and older unemployed men benefit from participation in our digital peer group-based approach, however, the way they benefit differs. We thereby expand literature by providing first insights that the effectiveness of digital technologies to address unemployment of older individuals is contingent on gender. In our study, both men and women increased their reemployment chances through higher job search intensity and better job search skills. More concretely, men benefitted from increasing their *number of distinct application activities*, *number of applications*, *interview application skills*, and *job search clarity* while women benefitted from increasing their *number of invitations to job interviews*, *interview application skills*, *job search clarity*, and *written application skills*. However, we only observed a direct effect on placement success for women who participated in the digital peer groups during-Corona. Prior research suggests that women and men face different situations on the job market: women are confronted with additional obstacles and disadvantages in their job search, such as gender stereotypes and the double burden of unpaid caregiving responsibilities at home (e.g., Elder and Kring 2016; ILO 2022a). Moreover, women suffered stronger impacts from the COVID-19 pandemic (Gezici and Ozay 2020). Thus, our findings imply that our digital peer group-based approach might be particularly beneficial for older unemployed that face disadvantages in the job market, such as age and gender discrimination. Our approach can thus especially help vulnerable groups like older unemployed women, who can anonymously discuss sensitive issues like prior discrimination experiences or balancing family life and job search. This could be explained with related studies, which suggest that anonymous online peer groups are used for mutual social support on particularly sensitive personal issues and obstacles (Felgenhauer et al. 2019a). While our study is the first to demonstrate gender differences in the effectiveness of digital technologies to address unemployment of older individuals, recent research has found that the gender gap in reemployment after COVID-19 job losses can depend on further contextual factors, such as occupational segregation (Qian et al. 2023). Accordingly, our findings imply that future research should further explore the nuances of digital labor market interventions' effectiveness across different population groups. Specifically, it should investigate characteristics beyond gender to identify which groups particularly benefit from digital interventions.

On the other hand, our findings indicate that our digital peer group-based approach is especially effective in combatting unemployment during crises that affect the job market. The COVID-19 pandemic led to a global job market crisis (Blustein et al. 2020; ILO 2022a), with hiring freezes implemented in many companies and organizations. Especially older unemployed individuals were faced with lower reemployment chances (Bui et al. 2020; Pit et al. 2021). Thus, the analysis of data from our field experiment was performed separately for participants of digital peer groups before the COVID-19 job market crisis started and participants during

the job market crisis. With regards to placement success, our results show a better development of the treatment group compared to the control group only for women that participated during the crisis. This implies that participation in our digital peer group-based approach can be especially effective in times when reemployment chances are lower. With this interesting finding, we expand existing knowledge on digital peer groups, as their effectiveness contingent on external factors such as crisis situations has not yet been researched. Indeed, our digital peer groups assisted older unemployed individuals in their job search in a different way since the job market crisis started: Older unemployed individuals tended to benefit from participation in our approach in terms of improved *written application skills* and *interview application skills* before the crisis started and, in contrast, tended to benefit in terms of *job search clarity* during the crisis. Since the COVID-19 job market crisis started, the relevance of written and interview application skills seems to have decreased while the relevance of job search clarity seems to have increased for older unemployed individuals. This could be explained by widespread hiring freezes, which have made immediate application skills less relevant while highlighting the importance of sharpening one's strategic positioning in the job market for future opportunities. Furthermore, we observe a shift in social support types contained in the exchange of messages, since the job market crisis started: especially for older unemployed women in our digital peer groups, the exchange of emotional, esteem, and network support increased during the crisis compared to before. Additionally, the outbreak of the COVID-19 job market crisis brought up new topics, which were discussed in the digital peer groups, including new career paths, labor market situation, application process, as well as free time and hobbies. Our findings imply that the deterioration of the job market, which altered and even exacerbated the common challenges faced by older unemployed, also shifted the usage and effectiveness of digital peer groups in combating unemployment. This intriguing finding extends literature on digital peer groups, which emphasize the flexible alignment of peer groups with participants' needs (e.g., Ellis et al. 2020). Our study demonstrates that digital peer groups can flexibly adapt to shifting or even increasing challenges, such as crisis situations, without modifications to their design. Not only does the way peers engage with the digital peer group change, but the benefits from participation also change. Given that our digital peer group-based approach was particularly effective for women during the COVID-19 job market crisis, the benefits from participation might be even more substantial when participants face more severe challenges, such as crisis situations.

Collectively, our nuanced findings on the effectiveness of our digital peer group-based approach across different subgroups imply that future research should further investigate contextual factors and consider gender and job market situation as potential moderators of the impact of digital job market interventions.

Aside from these theoretical implications, our digital peer group-based approach has the potential to positively impact job counseling in practice:

First, our results show that digital peer groups can help both men and women to regain employment. This holds true both in crisis situations, such as the COVID-19 pandemic, as well as in ordinary times. However, for different groups (in our case, men and women pre- and during-Corona) the effects on placement success and success indicators predicting reemployment varied. Thus, our digital peer

group-based approach should be combined with other measures such as traditional job counseling.

Second, our research is an important step towards modernizing and digitizing job counseling to provide more effective, innovative, and accessible forms of counseling, a need that has been amplified by the COVID-19 job market crisis (e.g., Cedefop et al. 2021). Our approach proved to be especially effective during the COVID-19 pandemic and has already been implemented in follow-up projects in other regions. Going forward, the digital peer group-based counseling approach could reach a wider audience of unemployed individuals and support them in their job search journey.

Third, by focusing on older unemployed individuals, our study constitutes one step towards digitizing services for less tech-savvy populations. Prior literature showed that older unemployed individuals are open to integrate digital media in their job search (Klier et al. 2020) and that social media engagement helped deal with psychological consequences of job loss (Suphan et al. 2012). This is supported by research suggesting that digital engagement improves social connectedness in older individuals (Morris et al. 2007). Our study provides evidence that older individuals not only use digital services, but also benefit from usage for their job search. Thus, when designing labor-related services for older unemployed individuals, it could be beneficial to integrate digital offerings.

Finally, labor agencies and other organizations that aim at helping unemployed individuals gain reemployment can draw important conclusions from the distribution of social support provided in the digital peer groups. For all groups and phases, participants predominantly used the digital peer group to exchange messages containing informational support, followed by esteem support. Thus, these two support types seem to be particularly important for unemployed older individuals, and both traditional as well as more innovative measures could put a stronger focus on the provision of informational and esteem support. As many labor interventions struggle with budgetary constraints, digital peer groups constitute an effective and efficient instrument to provide unemployed individuals with social support.

7.2 Limitations and directions for future research

Although our findings provide interesting new insights, we acknowledge the limitations of this study. First, notwithstanding the strength of the field experiment, which was conducted with 987 participants in cooperation with the German Federal Employment Agency, to evaluate our novel approach, the findings might not be fully applicable to job market institutions in all global countries. Since our chat groups were implemented in 15 agencies in the state of Baden-Wuerttemberg, we are confident that our dataset provides a solid foundation for our analysis. Nevertheless, we recommend that researchers could conduct experiments with our artifact in a different case setting, for instance in a country with a decidedly different work culture than in Western Europe.

Second, as in many experimental studies and field experiments, our sample of participants—i.e., those that volunteered to participate when being approached by

the Federal Employment Agency—may be afflicted with self-selection bias: those who agreed to participate might have already taken proactive steps to find reemployment or might be especially motivated to interact with others and provide and seek support. To mitigate this bias, we assigned participants who chose to participate randomly into treatment and control groups and provided only necessary information about the study in advance.

Third, while we were able to demonstrate practical applicability and efficacy of our novel artifact, we do not observe exact causes of outcomes. Our study did not provide the opportunity to directly link the efficacy of the artifact to specific design decisions and theoretical assumptions (Sonnenberg and vom Brocke 2012). For instance, the impact of digital artifact affordances or certain types of social support remains unclear. In our summative and naturalistic evaluation in collaboration with the German Federal Employment Agency, the possibilities for manipulation were limited as we dealt with real unemployed individuals as subjects. Thus, we call for future research that pursues more formative evaluation of our artifact, contributing to the understanding of the relationships between single design decisions, the presence of social support types, and outcomes with respect to reemployment. For instance, an interesting next step would be to compare digital peer groups and physical peer groups (Förster et al. 2022). Furthermore, it could be worth to analyze the role and effect of moderators by comparing digital peer groups with and without moderators. Finally, the impact of single types of social support might be investigated through manipulation of distinct types of social support, for instance, with the help of moderators or incentives. We encourage researchers to supplement our quantitative evaluation with qualitative studies, such as interviews and focus groups, enhancing the understanding of the causes of digital peer groups' effectiveness.

Finally, while we reported significant positive effects on perceptional and objective measures, the limited observation period did not allow us to analyze long-term effects. Especially the variable employment status needs to be scrutinized over a longer period of time—effects might appear several months after the end of participating in our approach. Against this background, we suggest that future research could investigate long-term effects of digital peer groups by conducting longitudinal studies.

8 Conclusion

Unemployment of older individuals is associated with severe societal and individual consequences (e.g., Klehe et al. 2012; Murdock et al. 2021). Digital peer groups have been shown to support individuals dealing with unemployment through fostering mutual social support (e.g., Felgenhauer et al. 2019a; Klier et al. 2019). While the potential of digital peer groups in the context of unemployment has been demonstrated for younger populations (Klier et al. 2019), older unemployed individuals face even lower chances of regaining employment (Tisch 2015). Recent studies underline that older individuals respond positively when digital offerings are designed to meet their specific requirements (Xie et al. 2021) and when there is a clear benefit or need (Sixsmith et al. 2022). Initial research even shows that older

individuals are willing and able to successfully leverage tailored digital technologies in their job search (Klier et al. 2020; Dillahunt et al. 2021; Sigler 2021).

Against this background, our study developed and evaluated a novel digital peer group-based approach to assist older unemployed individuals in finding employment. Building on the advantages of digital technologies and social support in peer groups, we designed an IT artifact specifically designed for older unemployed individuals. We demonstrated the practical applicability of the artifact by instantiating it for the case of the German Feder Employment Agency, and we showed how the artifact can be used in terms of mutual social support. We evaluated the efficacy of the artifact in a controlled field experiment with 987 participants, investigating its impact on reemployment as well as on indicators predicting reemployment of older unemployed individuals.

We contribute to literature and practice in several ways. First, leveraging the potential of digital technologies, we propose the first digital peer group-based approach specifically designed to assist older unemployed individuals regain employment, tackling this pressing societal issue. In our approach, we enabled older unemployed individuals to connect with peers and receive peer support in small and moderated digital chat groups through an online messenger application. Second, our naturalistic and summative evaluation in the form of a large-scale field experiment provides novel insights into the effectiveness of digital technologies, especially digital peer groups, for reemployment of older unemployed individuals. We expand the existing research on digital technologies in the context of unemployment by demonstrating that older unemployed individuals benefit from participation in digital peer groups with regards to job search intensity and job search skills. Moreover, a more fine-grained evaluation of when and for whom the artifact is particularly effective provides first insights that the effectiveness of digital peer groups to address unemployment of older individuals is contingent on gender and job market situation, warranting further recognition in research. We hope our paper will encourage future research to study the fascinating power of digital peer groups.

Funding Open Access funding enabled and organized by Projekt DEAL.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose and have no competing interests to declare.

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