

RESEARCH

Open Access



The impact of technology readiness and adapting behaviours in the workplace: a mediating effect of career adaptability

Ernest Kumi^{1*}, Hannah Vivian Osei², Sampson Asumah³ and Abraham Yeboah¹

Abstract

This study aims to explore the impact of technology readiness (TR) on career adaptability (CA) and adapting behaviours among public sector workers in Ghana. It also examines the mediating role of CA in the relationship between TR and adapting behaviours. The study adopts a quantitative research design using a survey method. A sample of 484 public sector employees from various government agencies and departments in Ghana is selected. The study employed a non-probability sampling procedure that combined convenience and purposeful sampling. The data are analysed using covariance-based structural equation modelling with AMOS v24 to test the hypotheses and the proposed conceptual model. The results show that TR has a positive and significant effect on CA, boundary integration, and job crafting. CA also has a positive and significant effect on boundary integration and job crafting. Furthermore, CA mediates the relationship between TR and the two adapting behaviours. This study is one of the first to investigate the influence of TR on CA and adapting behaviours. It reveals how employees respond to the challenges and opportunities of technological innovation and work transformation. It also provides useful insights and recommendations for enhancing technology adoption and career development among public sector workers, especially in developing countries.

Keywords Career adaptability, Technology readiness, Boundary integration, Job crafting, Public sector, Adapting behaviour

Introduction

Ghana, a nation known for its rich cultural heritage and diverse landscapes, is experiencing a significant transformation in the digital age. The nation's public sector has entered a new era characterized by rapid technological change as technological advancements continue to reshape the global landscape [10]. This transformation has brought about a pressing need for public sector

employees to adapt to evolving technologies and changing work dynamics. It is within this context that the present study seeks to examine the intricate relationship between technology readiness (TR), career adaptability (CA), and adapting behaviours among public sector workers in Ghana. The public sector in Ghana serves as a vital cornerstone for the nation's development and governance. It encompasses a wide range of government agencies and departments responsible for delivering essential services to citizens, including education, health-care, infrastructure development, and public administration [64]. In recent years, the Ghanaian government has undertaken significant initiatives aimed at modernising operations within the public sector. This modernization drive has brought about the introduction of various digital tools and systems such as the digitalization of

*Correspondence:

Ernest Kumi
ernest.kumi@stu.edu.gh

¹ Department of Marketing, Sunyani Technical University, Sunyani, Ghana

² Department of Human Resource and Organisational Development, KNUST School of Business, Kumasi, Ghana

³ Department of Management and Secretaryship Studies, Sunyani Technical University, Sunyani, Ghana



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

ports, health insurance, and financial systems, alongside the adoption of e-government platforms, are enhancing operational efficiency [3, 12]. Consequently, public sector employees in Ghana are now witnessing a surge in technological advancements and the integration of digital tools into their work environments [29]. These technological innovations aim to enhance efficiency, transparency, and service delivery, aligning with broader national development goals [78].

The digital sector's robust growth, averaging 19% annually from 2014 to 2020, is a testament to this commitment [10]. With a \$200 million boost from the World Bank, Ghana is poised to expand broadband access, refine digital public services, and fortify its digital innovation ecosystem (Sommer 2023). Inclusion efforts are also underway, targeting women, the disabled, and rural populations (Sommer 2023). Moreover, Ghana's ascent in the UN's E-Governance Survey to 101st globally and fifth in Africa underscores its progress (Group 2019). The ICT sector, currently valued at \$1 billion, is projected to quintuple by 2030 [10]. While this transformation heralds increased productivity and innovation, it also brings challenges like skill gaps and resistance to change, necessitating that employees adapt and acquire new competencies [39, 67]. This strategic shift is crucial for Ghana's sustained development and the well-being of its citizenry, promising significant enhancements in service quality and delivery. Thus, the adoption of technology in the Ghanaian public sector has brought both opportunities and challenges. On one hand, it has the potential to streamline processes, reduce bureaucracy, and improve service delivery. On the other hand, this digital transformation necessitates a workforce that is not only technologically competent but also adaptable to the changing demands of their roles [10]. As public sector employees grapple with the integration of new technologies into their daily routines, the ability to adapt becomes a critical factor for organisational success. One of the central components of this study is the concept of technology readiness, which pertains to an individual's willingness and ability to embrace and effectively use technology [15]. For public sector workers, TR can encompass their comfort with digital tools, their confidence in handling technological challenges, and their openness to learning and adopting new technologies.

In similar, career adaptability plays a pivotal role in an employee's ability to navigate the evolving landscape of the public sector [54]. CA is defined as an individual's capacity to manage their career development and successfully transition through career stages in the face of changing circumstances [98]. It involves four key components: concern, control, curiosity, and confidence. Public sector employees who exhibit high career adaptability are

more likely to thrive in the midst of technological change and shifting job roles [32]. Although the significance of TR in the workplace has been acknowledged in existing literature, such as the examination of how automation technology affects career adaptability [118] and the exploration of technology readiness's influence on adaptive performance [1], there exists a necessity to conduct a more in-depth analysis of how technology readiness specifically influences career adaptability within the distinct context of the Ghanaian public sector. Moreover, understanding how career adaptability influences adapting behaviours, such as boundary integration (BI) and job crafting (JC), in this setting is also an underexplored area [2, 21].

The public sector in Ghana stands as a pivotal entity in national development, yet the details of its workforce dynamics remain insufficiently explored. This study is prompted by discernible academic gaps that necessitate a rigorous examination of the variables and theoretical frameworks governing employee behaviour within this sector. Specifically, there is a dearth of research addressing the influence of career adaptability on behaviours such as boundary integration and job crafting, especially when considered in the light of technology readiness as an antecedent of career adaptability [19, 79]. Past studies have yielded inconsistent findings regarding the predictors of boundary integration and job crafting [50, 97], highlighting a fragmented theoretical understanding that this research aims to consolidate. The inclusion of career adaptability as a mediator is predicated on its potential to elucidate the processes through which employees navigate and shape their work environments amidst technological and organisational changes [119]. This study will not only strive to rectify the gaps and inconsistencies observed in previous research but also expand the theoretical discourse by integrating the concept of career adaptability into the broader narrative of people management within the Ghanaian public sector. By investigating these relationships, the research will offer novel insights into the adaptive strategies employed by public sector employees, thereby contributing to the optimization of human resource practices in a rapidly modernizing context.

This study aims to bridge this gap by empirically examining these relationships. The findings of this research will provide valuable insights for policymakers, public sector managers, and human resource practitioners in Ghana. Understanding how TR and career adaptability influence the ability of public sector employees to integrate boundaries and craft their jobs can inform strategies for workforce development, training, and career management. Ultimately, this study seeks to contribute to the enhancement of public sector efficiency and the

advancement of career development opportunities for employees in Ghana. The purpose of the research is to understand the dynamics of TR, career adaptability, and their impact on adapting behaviours such as boundary integration and job crafting in the context of the new world of work, where digitalization and automation are transforming the nature of jobs and careers. Additionally, the study seeks to understand the potential mediating role of career adaptability in the relationship between technology readiness and adapting behaviours.

The Career Construction Model of Adaptation (CCMA) also contributes theoretically to the study by providing a framework to understand how individuals construct their careers through adaptation [95]. In the context of the study on technology readiness and career adaptability among public sector workers in Ghana, the CCMA offers a lens to examine how these workers proactively adapt to technological changes. It suggests that individuals with higher levels of career adaptability are likely to be more prepared for and responsive to the integration of new technologies in their work environment. By applying the CCMA, the study can explore the mediating effects of career adaptability on the relationship between technology readiness and adapting behaviours, providing a deeper theoretical understanding of the dynamics at play in the modern workplace. Previous studies on the CCMA have not attended to these links [56, 60]. This study is pivotal for Ghana's public sector as it aligns with the nation's digital transformation goals. It explores how employees' readiness for technology influences their adaptability, crucial for modernizing government services. The findings could guide policies on technology training and development, enhancing efficiency and governance. Ultimately, this research supports Ghana's ambition to become a regional ICT innovation hub, with significant implications for economic growth and public service delivery.

This study aims to address the following questions: What is the impact of technology readiness on workers' career adaptability? How does career adaptability affect adaptive behaviours such as boundary integration and job crafting? And does career adaptability serve as a mediating factor in the relationship between technology readiness and these adaptive behaviours?

Literature review and hypothesis development

The Career Construction Model of Adaptation

The Career Construction Model of Adaptation (CCMA) is a framework for understanding how individuals choose and use work in their lives. It consists of four dimensions: adaptive readiness, adaptability resources, adapting responses, and adaptation results. These dimensions form a sequence of adaptation that shows how

individuals cope with vocational development tasks, occupational transitions, and work traumas. The CCMA is based on the career construction theory (CCT), which emphasises the role of life themes and self-organisation in shaping vocational behaviour [96]. In the CCMA, adaptive readiness represents an individual's enduring traits related to their flexibility, willingness to engage in career development tasks, manage professional transitions, and effectively respond to challenges [95]. This trait is considered fundamental and essential for adaptability. It encompasses characteristics such as proactive personality, openness to new experiences, and conscientiousness [107]. Grit [117], promotion and prevention focus [83], and career agility [21].

We use technology readiness, a trait that reflects how people embrace and use new technologies, as a specific empirical indicator of adaptive readiness in our study. The second dimension, adaptability resources, assesses an individual's preparedness to confront professional challenges, transitions, and setbacks. These resources are tools for self-regulation that help individuals navigate complex career-related issues and personal difficulties. CA plays a significant role in developing and utilising these resources. We use the Career Adaptability Scale (CAAS) as a widely accepted measure for adaptability resources [90, 95]. Adapting responses, the third dimension, involves observable behaviours in response to changing career conditions. This includes activities such as career planning, research, exploration, decision-making, and commitment [91]. While the CCMA primarily focuses on these responses, it has not delved deeply into concepts like boundary integration and job crafting behaviours. Our study incorporates these constructs to define adapting responses, which are crucial in shaping adaptive outcomes. The final dimension, adaptation results, reflects the outcomes of the career construction process and how they impact an individual's career trajectory. These outcomes include success, job satisfaction, career commitment, stability, and positive affect [91]. We presume positive associations between adaptivity, adaptability, and adapting behaviours, resulting in favourable adaptation results. Previous meta-analyses have explored the relationships between various facets of the CCMA [91], reinforcing the model's significance. In essence, we believe the model offers a framework for understanding how technology readiness, CA, and adaptive behaviours are interconnected in the context of career development and adaptability.

Technology readiness in the workplace

Technology readiness is how well individuals and organisations can use and benefit from new technologies and digital tools in their work. TR depends on psychological,

behavioural, and organisational factors that affect how people and groups accept and adapt to technology changes [87]. TR is vital for modern workplaces because it helps them achieve various goals. First, it helps them to improve productivity, efficiency, and competitiveness by using digital tools to simplify and automate work processes [77]. Second, it helps them foster innovation and adaptability by being open to new solutions and staying updated with technological advancements [15]. Third, it helps them gain a competitive edge by responding to market and customer needs with the latest technologies [75]. Fourth, it helps them increase job satisfaction and retention by reducing frustration and enhancing comfort with technology [108]. Fifth, it helps them to make informed decisions and strategic plans by collecting and analysing data effectively [25]. Previous studies have explored how TR affects learning and career outcomes in different settings. However, there is a gap in research on how TR influences the professional trajectories of personnel. The only exception is a study in Malaysia that linked TR to job meaningfulness and adaptive performance [1].

Career adaptability

Career adaptability is the ability to cope with and benefit from career changes and opportunities [93]. It is essential for career development and well-being in today's uncertain and dynamic work environment [30]. CA has four dimensions: concern, control, curiosity, and confidence. They indicate how much people care about, manage, explore, and trust their career prospects [95]. Environmental factors, psychological capital, social support, and personality all have an impact on CA. CA leads to positive career outcomes, such as satisfaction, well-being, performance, and resilience [19]. CA helps people deal with career transitions, reduce stress and uncertainty, and learn new skills [5, 115]. CA also helps people recover from career setbacks, enhance resilience and well-being, and plan their career goals and actions [52, 113]. CA shows employers that employees are resourceful, resilient, and eager to learn and grow [37]. Many studies have examined the impact of CA on career development and well-being, such as job satisfaction, career success, and employability [58, 65, 68].

Adapting behaviour in the workplace

Workplace adaptation is vital for personal and organisational success. It means employees adjust their roles to fit their strengths, interests, and needs, improving job satisfaction and engagement. It also means employees communicate and collaborate across departments, anticipate changes, and learn new skills. Workplace adaptation depends on organisational culture, effective leadership,

and available resources [88]. Workplace adaptation benefits employees by giving them control, satisfaction, and less stress. It also benefits organisations by increasing innovation, teamwork, and competitiveness. Adapting to changes boosts skills and employability, ensuring career success. As organisations change, adapting behaviours is essential for individual and collective success in the workplace [73].

Boundary integration behaviour

Boundary integration is how individuals balance and harmonise their work and personal lives [17]. It is based on the idea of work-life balance, a dynamic balance between one's professional and personal lives. It involves actions individuals take to manage both work and non-work roles effectively, such as flexible work arrangements, technology-mediated communication, and adaptation strategies [18]. BI is important for individual well-being and job satisfaction. It reduces stress, increases life satisfaction, and improves mental and physical health [86]. It also enhances job performance and productivity, as individuals can focus on tasks without stress from unmanaged boundaries [16]. Organisations that support BI can benefit from increased employee engagement, reduced absenteeism, and improved recruitment and retention [114]. These benefits lead to a healthier and more productive workforce [61]. BI has challenges, such as conflicting work demands, a lack of flexibility support, and blurred work-personal life boundaries due to technology [114]. BI has facilitators, such as work-life balance policies and culture, time management skills, and personal boundaries. Technologies such as mobile devices and telecommuting tools can help individuals integrate their work and personal lives.

Job crafting behaviour

Job crafting is how employees proactively reshape and personalise their job roles, aligning tasks, social interactions, and cognitive perspectives with their preferences, strengths, and values [35]. Based on self-determination theory [27], JC meets innate needs for autonomy, competence, and relatedness. It shows employees fulfilling these needs and enhancing autonomy. Social Cognitive Theory also supports JC, highlighting how individuals learn from others' role personalisation [11]. JC is influenced by proactive personalities, an internal locus of control, supportive leadership, and an organisational culture that values flexibility, creativity, and well-being [85, 106]. JC is important for individuals and organizations. It increases job satisfaction, engagement, and fulfilment, aligning work with personal values and strengths [66]. It also improves job performance and productivity as employees adapt tasks to their skills and interests.

Organisations benefit from increased motivation, commitment, reduced turnover, and higher job satisfaction. JC promotes adaptability, innovation, and continuous improvement in teams [112]. JC is a dynamic concept essential for employee well-being and organisational success. Organisations can use JC to foster engagement and continuous improvement. Understanding the influencing factors is key to supporting employees in crafting fulfilling work experiences.

Technology readiness and career adaptability

Technology readiness is the skill to adopt and apply new technologies in work, which is vital for career readiness and success. It means people, such as public workers, use these technologies to reach their goals, which helps to improve work efficiency and productivity [1]. Career adaptability is the ability to cope with career changes and pursue meaningful goals. This readiness enables workers to acclimatise to the ever-changing demands and expectations of their roles, as well as the evolving needs and preferences of their clientele [99]. Moreover, technology readiness encompasses robust digital literacy and competence, fostering self-directed learning and personal career development [72]. Employees who are technology-ready gain access to diverse information sources, feedback channels, and training opportunities, augmenting their knowledge, skills, and career prospects [22]. In addition, TR encompasses a keen understanding of the strengths and limitations of various technologies, coupled with the ability to judiciously select and apply the most suitable ones for specific situations [15]. In this context, technology-ready workers execute their tasks with heightened effectiveness and efficiency while approaching problem-solving with creativity and innovation.

Furthermore, TR underscores proficiency in information management and analytical skills, enabling the adept processing and interpretation of extensive data from diverse sources [4]. Technology-ready employees make evidence-based, logical decisions and communicate their findings with clarity and persuasiveness. Adaptability is also intrinsic to technology readiness, as it fosters flexibility and resilience essential for navigating the uncertainty and complexity inherent in the adoption of new technologies [53]. Thus, workers who exhibit readiness for technology are adept at overcoming challenges and risks associated with technological change, allowing them to harness the opportunities and advantages technology affords. Hence, TR serves as a potent predictor and facilitator of career adaptability among workers, equipping them to thrive in the dynamic and competitive landscape of the contemporary professional world. The CCMA emphasises individual differences in adaptive readiness, adaptability resources, and coping behaviours,

which contribute to successful integration into essential work roles. Adaptivity, a precursor to career adaptability, signifies an individual's willingness to address occupational uncertainties and engage in developmental actions during career transitions. Previous research has predominantly explored the relationship between career adaptability, the Big Five personality traits, and career adaptability and found positive results [41]. Apart from the examination of the Big Five personality traits and their connection to career adaptability, recent academic studies have been increasingly exploring how various individual dispositional variables and contextual factors influence career adaptability. These factors encompass career decision self-efficacy [94], developmental leadership and career optimism [28], employability skills [104], hope, and life satisfaction [71]. Additionally, research has delved into aspects such as within-person variability in personality [101], proactive personality [110], person-organisation fit [42], career agility [21], and emotional intelligence [46]. We therefore hypothesise that:

H1: Technology readiness is positively related to career adaptability among workers.

Career adaptability and adapting behaviours (boundary integration and job crafting)

Individuals are now more than ever confronted with an ever-changing work environment as a result of employment restructuring, technology improvements, and globalization. Careers have become less predictable as a result of these changes, and individuals must increasingly take responsibility for their own career growth [31, 110]. As a result, self-directed and personalised career routes have gained prominence, and personal resources (i.e. career adaptability) have become increasingly important for effective professional growth [98]. CA is the skill to cope with job duties and changes with future concern, control, curiosity, and confidence. Future concern helps plan for future roles, control means self-discipline and career responsibility; and curiosity fosters interest in future selves. Boundary integration is the blending of work and family activities when one affects the other, using resources and experiences from other domains to help the current one. Boundary integrators may feel more satisfied. Thus, happy employees may think better and be more creative in doing their job tasks [6]. This is a concept that is inextricably linked to career adaptability resources.

Job crafting refers to proactive modifications in job design that are not negotiated with the organisation [105]. It is suggested that the manager is unlikely to detect these modifications. Job crafting is defined as altering the parameters and conditions of job tasks and relationships, as well as the job's meaning [35]. Thus, employees

can alter how work is conceptualised and performed (i.e. alter task boundaries), how frequently and with whom they engage at work (i.e. alter relationship boundaries), and how they cognitively attribute meaning and value to their job (i.e. alter relationship boundaries) (i.e. changing meaning). Job-crafting can result in a variety of beneficial effects, including increased job engagement, job satisfaction, resilience, and thriving [26]. Due to how the work environment is always changing, employees would have to modify their job design so they could obtain maximum satisfaction from their job and also for effective professional (career) growth. Employees should also be able to take charge of how to effectively combine their work life with family life as they take charge of their career growth. From the discussions above, it can be deduced that career adaptability can influence the job crafting and boundary integration behaviours of employees. Consistent with the career construction theory of adaptation [95], empirical investigations of the CCMA [56], longitudinal adult sample in Afghanistan [43], and Chinese Adolescents sample [105], this study proposes that career adaptability resources might play a key role in explaining how personality can be associated with adapting behaviours.

H2a: Career adaptability is positively related to adapting behaviours, operationalized in terms of boundary integration behaviours.

H2b: Career adaptability is positively related to adapting behaviours, operationalized in terms of job crafting behaviours.

Technology readiness and adapting behaviours (boundary integration and job crafting behaviours)

Technology readiness measures how eager someone is to adopt new technologies for their purposes. It has four aspects: optimism, innovativeness, discomfort, and insecurity. Optimism means seeing technology as beneficial, while innovativeness means being willing to try it. Discomfort means feeling overwhelmed by technology, while insecurity means worrying about its effects on safety and privacy. Boundary integration is how one balances work and personal life. It has two types: segmentation, which means keeping work and personal life apart, and setting clear boundaries to avoid conflict or confusion and ease role switching [20]. Integration is a strategy that involves merging work and personal life, allowing overlap. Individuals who favour integration maintain flexible boundaries, blending roles and contexts, and may engage in cross-role interruptions [26].

It is noteworthy that various factors influence boundary integration, including individual preferences, personality traits, career stage, family structure, organisational culture, and technological affordances. These factors collectively impact how individuals choose to manage

the boundaries between their work and personal lives [86]. Additionally, one's approach to BI carries significant implications for aspects such as work-life balance, well-being, performance, and career development [116]. Job crafting behaviour involves individuals aligning their job roles with their personal preferences to achieve their goals. This behaviour enhances employee well-being and improves performance by ensuring a better fit between their abilities, needs, values, and job demands. It means changing work tasks, skills, colleagues, and perspectives to make work meaningful [114]. Individuals who exhibit higher levels of technology readiness are more likely to have positive attitudes and beliefs about technology [15]. They tend to view technology as a valuable tool for improving their lives and work [81].

Given their optimism and willingness to embrace new technologies, these individuals are likely to leverage technology to enhance communication and collaboration with external stakeholders. By using technology, they can more effectively connect with customers, suppliers, and other external parties, exchange information, and build trust. Thus, technology readiness is expected to positively influence boundary integration behaviour by facilitating these crucial interactions. Highly technology-ready individuals tend to be innovative and curious about technology, seeking opportunities to enhance their work performance and efficiency [34]. With a positive outlook on technology, they are inclined to explore new ways to modify their tasks, skills, relationships, and cognitive processes at work [13]. TR is anticipated to empower these individuals to adapt their roles more effectively to fit their personal preferences and goals. For instance, they might use online courses to learn new skills or collaborate on digital platforms to modify their work relationships. Therefore, TR is expected to have a positive influence on job crafting. Therefore, we suggest that:

H3a: Technology readiness has a positive relationship with employees' boundary integration behaviour.

H3b: Technology readiness has a positive relationship with employees' job crafting behaviour.

Career adaptability as a mediator between technology readiness and adapting behaviours

Technology readiness is a personal trait that reflects one's openness and willingness to use new technologies, innovation, and change in their work [80]. A high TR means one is ready to adopt new technologies effectively and cope with changing work environments. Career adaptability is a psychosocial resource that helps one navigate both expected and unexpected career transitions [51]. It enables one to prepare for and engage in job roles and adjust to changes in their work environments. High TR may lead to effective technology adoption. In today's

fast-paced and technology-driven work landscape, integrating work and personal life effectively is essential [69]. This requires boundary integration behaviours, which involve blending work and personal life and reducing conflict between them [86]. Career adaptability can act as a mediator between TR and boundary integration behaviours. High career adaptability resources provide one with the psychological strength to handle career transitions successfully and self-regulate their work and non-work activities [90]. Adaptable individuals with career adaptability resources are more likely to have the flexibility and resilience to integrate work and personal life effectively. Previous studies support this argument. For example, Savickas et al. [95] highlight the interaction among adaptive readiness, adaptability resources, adapting behaviours, and adaptation outcomes [57]. These findings are consistent with the idea that career adaptability mediates the positive relationship between TR and boundary integration behaviours.

Career adaptability, as a key resource in the CCMA, enhances one’s ability to navigate career transitions, adapt to changes, and effectively self-regulate their work and non-work activities. Job crafting behaviours are important for responding to the dynamic nature of the modern workplace. Employees need the flexibility and autonomy to modify their job roles to maximise job satisfaction and professional growth [35]. Career adaptability can serve as a mediator between TR and job crafting behaviours. Individuals with high TR are more open to innovation and change. Career adaptability resources can empower these individuals to proactively engage in job crafting. Job crafting behaviours are a way of adapting one’s job role, and career adaptability provides the necessary resources to facilitate

this process effectively [7]. Several studies support this argument. For example, studies have examined how HR practices mediate the relationship between career adaptability and job crafting and have found positive associations between them [36]. A positive relationship between career adaptability and job crafting behaviours has also been found among employee and supervisor dyads in the Netherlands [111]. Additionally, a positive relationship between career adaptability and job crafting behaviours has been found among supervisors and subordinates from the Netherlands [109]. In conclusion, these hypotheses are based on established theories and empirical evidence. Career adaptability, as a mediating factor, can explain the relationships between TR, boundary integration, and job crafting behaviours [65]. As the workforce continues to evolve in response to technological advancements and changing work dynamics, understanding these relationships becomes increasingly important. We therefore hypothesise that:

H4: Career adaptability mediates the positive relationship between TR and boundary integration behaviours.

H5: Career adaptability mediates the positive relationship between TR and job crafting behaviours.

The conceptual model of this study examines how TR influences career adaptability and two adapting behaviours: boundary integration and job crafting. The framework proposes that TR has a positive effect on career adaptability, which in turn has a positive effect on both boundary integration and job crafting. Moreover, the framework suggests that career adaptability mediates the relationship between TR and the adapting behaviours (Fig. 1).

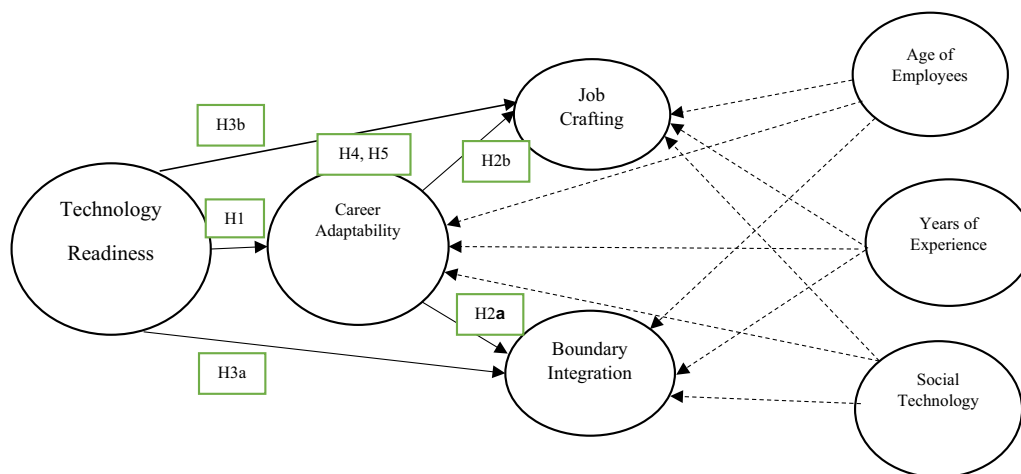


Fig. 1 Conceptual model. Note: H4 and H5 represent the indirect paths. Age of employees, years of experience, and social technology are control variables

Materials and methods

Sample and data collection

The sample for this study consisted of middle- and senior-level staff from different public organisations in Ghana. The target population was the public sector workers with a minimum of a tertiary education. The study employed a non-probability sampling procedure that combined convenience and purposeful sampling. Guided by the list of government agencies in Ghana [40], all public sector entities were purposefully chosen, whereas the various respondents from the selected institutions were recruited using a convenience sampling approach. The data collection was done through a cross-sectional survey using structured questionnaires. To ensure the survey exclusively captured the perspectives of public sector employees, their direct supervisors assisted in identifying those who were both willing and available to take part. Additionally, the data collection occurred in two phases, each separated by a two-week lag, guaranteeing that only current employees of these institutions were included in the sample. In the initial phase, data related to employees’ demographics, job crafting, and career adaptability were collected. Two weeks later, the same group of workers underwent assessments based on their boundary integration and technology readiness levels. This approach also helped in the reduction of method bias [103].

The questionnaires had cover letters explaining the purpose and the ethical aspects of the study. We distributed self-administered questionnaires to 700 respondents in Ghana’s highly populated Greater Accra and Ashanti regions, chosen due to the significant government workforce in these areas, which accounts for 34.8 percent (Ashanti) and 16.5 percent (Greater Accra) of the total employment of approximately 688,000 individuals [47]. We filled out and retrieved 550 of the distributed questionnaires during the initial phase of data gathering. Subsequently, the second phase yielded 484 questionnaires that were suitable for analysis. Prior to analysis, each set of data underwent a meticulous verification process to ensure both its integrity and precision. The study’s conclusive sample encompassed 484 staff members, which equates to a 69% participation rate, a figure that comfortably meets the benchmark for statistical evaluation as established [63]. To maintain uniformity across the collected data, a coding system was implemented for the questionnaires to align with the responses provided by the employees. This process was initiated after a fortnight’s delay in the data collection phase. The initial data collection wave focused on evaluating the career adaptability, job crafting practices, and demographic profiles of the employees. The subsequent wave delved into assessing their technological readiness and their boundary

integration behaviours. The entire data acquisition spanned a period of roughly four months.

The study involved collecting data twice, with a two-week interval for each set of questionnaires, in order to mitigate method bias [84]. After identifying specific public entities, human resource officers within each participating firm acted as study coordinators, facilitating researchers’ access to personnel in the surveyed organizations. Respondents were randomly selected, and two study assistants, working alongside one author, distributed questionnaires to be completed by employees during work hours. All questionnaires were coded to facilitate identification and connection of an employee’s second response. The demographic analysis of our survey reveals a diverse group of respondents, with a female majority at 56%. Most are aged 31–40 (46%), suggesting a mature perspective likely to influence survey responses. Marital status shows 59% married, which may affect work-life balance opinions. Educationally, 50% hold a first degree and 37% a master’s, indicating a well-educated cohort capable of providing valuable insights. This demographic foundation is essential for interpreting our study’s results. Table 1 presents the complete set of demographic data.

Measures

The research utilised established scales with proven validity to assess a range of constructs. We presented a series of statements to the respondents and asked them to rate them on a five-point Likert scale. Participants were given statements and tasked with rating them using

Table 1 Descriptive statistics of respondents (N=484)

	Frequency	Percent
<i>Gender</i>		
Male	212	43.8
Female	272	56.2
<i>Age</i>		
20–30	99	20.5
31–40	223	46.1
41–50	112	23.1
51–60	50	10.3
<i>Marital Status</i>		
Single	191	39.5
Married	288	59.5
Divorced	5	1.0
<i>Educational Background</i>		
PhD	15	3.1
Masters	177	36.6
First Degree	244	50.4
Higher National Diploma	48	9.9

Source: Researchers’ field data

a five-point Likert scale, spanning from 1 (strongly disagree) to 5 (strongly agree). The principal constructs measured within the study included technology readiness, career adaptability, as well as boundary integration and job crafting behaviours. This method made sure that participants had a consistent and reliable way to say how much they agreed with the statements that were being presented. This made it easier to get strong, useful data that was relevant to the study's goals.

Technology Readiness: TR was measured using a 16-item scale [81]. The sample item is "Technology makes me more productive in my personal life". The Cronbach alpha for this study was 0.898, an indication of a high level of internal consistency and reliability.

Career Adaptability: Career adaptability was measured with a 12-item scale adapted from the career adaptability short form [70]. A sample item is "thinking about my future" and "taking responsibility for my actions". The Cronbach alpha of CA was 0.837.

Boundary Integration: The boundary integration was measured using a 10-item scale [62]. A sample item is "While I work, I handle personal or family responsibilities". The construct had a high Cronbach alpha of 0.838.

Job Crafting: Job crafting was assessed using a 12-item scale [100]. A sample question is: "I try to learn new things at work. It had a Cronbach alpha of 0.872".

Control variables

The study controlled for age, tenure, and the specific social technologies employed. Prior research, including a meta-analysis [91] and various studies [82], has indicated that age may influence career adaptability. Younger employees are expected to have fewer career adaptability resources compared to their older counterparts. Tenure was included as a control variable based on career construction theory-based studies [91], suggesting a potential connection with CA. Longer work tenure is anticipated to boost workers' CA. Research has also demonstrated a relationship between tenure and employee adaptability behaviours, implying that longer-tenured employees possess greater career adaptability resources than their shorter-tenured peers. Moreover, the type of social technology used by respondents was controlled for, given its known impact on CA and job crafting [118]. Both the challenges and opportunities presented by technology have been observed to enhance employees' creative capacities and behaviours.

Method bias analysis

Our study utilised Harman's single-factor test to evaluate common method bias (CMB), which could compromise our findings' validity. The test revealed that the principal factor explained only 29% of the variance, well below the

50% threshold indicative of significant CMB. This outcome suggests that CMB does not substantially affect our data, bolstering confidence in our results. The absence of a dominant single factor confirms that the observed variable relationships are likely genuine, not artefacts of the measurement approach.

Analytic strategy

The analytic strategy of this paper is to use covariance-based structural equation modelling (CB-SEM) to test the hypotheses and assess the model fit. CB-SEM is a statistical technique that allows researchers to examine the relationships among multiple observed and latent variables, as well as the effects of measurement errors and confounding factors. CB-SEM is suitable for this study because it can handle complex and multivariate data, test causal and mediating effects, and evaluate the validity and reliability of the constructs. The paper used IBM AMOS V26 as the software tool for conducting CB-SEM analysis. The paper followed a two-step approach [8]. The first step is to perform a confirmatory factor analysis (CFA) to test the measurement model, which specifies how the observed indicators relate to the latent variables. The second step is to perform a path analysis to test the structural model, which specifies how the latent variables relate to each other. The paper reports and interprets the results of descriptive statistics, reliability and validity tests, model fit indices, and path coefficients. We also discuss the implications, limitations, and directions for future research based on the findings.

Correlation of variables

The Pearson product-moment correlation coefficient was used to examine the connection between the variables in the research. The correlation coefficient's range of -1 to 1 indicates strong negative or strong positive relationships, not its causality. At the individual level, the descriptive statistics are shown in Table 2 with the mean and standard deviation. Except for the control variables, all of the main constructs had substantial positive associations at $p < 0.001$. With the descriptive statistics of the main construct, the mean ranges from 1.99 to 2.77, with a standard deviation of 0.84 to 1.02. For correlations among the variables, there was a significant positive relationship between job crafting and technology readiness with a correlation coefficient of 0.396 ($p < 0.001$). Again, there was a significant positive relationship between job crafting and career adaptability, with a correlation coefficient of 0.629 ($p < 0.001$).

Table 2 Means, standard deviations and correlations of variables in the study (n = 484)

	Mean	SD	1	2	3	4	5	6	7
1. Age of Employees	2.23	.892							
2. Years of Experience	2.15	.885	-.029						
3. Social Technology	2.32	1.019	-.028	.013					
4. Technology Readiness	2.3099	.99160	.028	.029	-.018				
5. Job Crafting	1.9941	.84863	.001	-.017	.001	0.396***			
6. Boundary Integration	2.7736	.91961	-.066	-.046	-.009	0.284***	0.315***		
7. Career Adaptability	2.1318	.83568	.001	-.017	.054	0.470***	0.629***	0.330***	

Significant at *p < 0.05; **p < 0.01; ***p < 0.001

Table 3 Reliability estimates of the study's scale

Variables	Cronbach alpha	Composite reliability
Technology readiness	0.898	0.904
Job crafting	0.872	0.874
Boundary integration	0.838	0.839
Career adaptability	0.837	0.842

Reliability measurement

In validating research scales, Cronbach's alpha and composite reliability are pivotal. Cronbach's alpha gauges item coherence on a scale, with values above 0.70 signifying reliability [74]. Yet, its accuracy may be overstated [24]. Composite reliability, considering item interrelations, offers a fuller reliability picture, favoured in SEM contexts for its thoroughness. Our study utilised both, with Table 3 displaying that constructs surpassing the 0.70 benchmark are reliable. This approach ensures a nuanced evaluation of scale reliability [45, 102].

Multicollinearity analysis

For the assessment of multicollinearity status between the study variables, AMOS statistical software was used. The data did not show signs of multicollinearity. The variance inflation factor (VIF) was used in the regression analysis to measure the extent to which one exogenous variable was linked to the other. The VIF value is a popular measure of multicollinearity [44]. There are no multicollinearity issues when a VIF value is less than or equal to 10, and tolerances larger than 0.1 should be used [9]. The levels of VIFs of the studied variables are between 1.09 and 1.65, confirming the non-existence of multicollinearity in Table 4. AMOS software assessed multicollinearity among study variables. No signs of multicollinearity were found. The regression analysis used the variance inflation factor (VIF) to measure how one exogenous variable related to another. VIF indicates

Table 4 Variance inflation factor

	T.R	JC	BI	CA
TR				
JC	1.185981			
BI	1.087062	1.110155		
CA	1.283532	1.654646	1.122209	

JC Job Crafting, T.R. Technology Readiness, B.I. Boundary Integration, C.A. Career Adaptability

Table 5 Square roots of average variance extracted

Variables	Average variance extracted	Square roots of AVE	MSV	MaxR(H)
Technology readiness	0.547	0.739	0.221	0.923
Job crafting	0.540	0.735	0.396	0.889
Boundary integration	0.511	0.715	0.109	0.841
Career adaptability	0.521	0.722	0.396	0.866

MaxR(H) Maximum reliability, MSV Maximum shared variance

multicollinearity [44]. VIF values below 10 and tolerance above 0.1 show no multicollinearity issues [9]. The VIFs of main variables ranged from 1.09 to 1.65, confirming no multicollinearity in Table 4.

Assessment of validity

We examined convergent and discriminant validity. Convergent validity evaluates how indicators measure a common component, while discriminant validity evaluates how scales measure different constructs in a model [48]. AVE, standardised factor loadings, MSV, square root of AVE, HTMT, and ASV were used to assess validity. Discriminant validity was confirmed when the square root of AVE was higher than the correlations with other constructs [38]. Table 5 shows the results.

Heterotrait–monotrait ratio as a measure for discriminant validity

Some authors [48] argued that the Fornell–Larcker measurement for discriminant validity was unsuitable for slightly different indicator loadings, and therefore a more rigorous method has been proposed known as the heterotrait–monotrait ratio (HTMT). Discriminant validity fails if HTMT values exceed 0.9. Table 6 shows the results below this threshold, confirming discriminant validity. Another manual approach is to assess cross-loadings of indicators on other constructs. Cross-loading shows how an indicator relates to other constructs. Table 6 displays cross-loadings and HTMT results.

We conducted confirmatory factor analyses to assess the fit of a four-factor model. We aimed to examine the distinctiveness of the constructs related to technology readiness, job crafting, boundary integration, and career adaptability, while also considering control variables such as the age of employees, years of experience, and social technology use. To evaluate model fit, we employed several goodness-of-fit indices recommended for structural equation models (SEM) [59]. These indices included the Chi-square model fit statistic (χ^2), the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the standardised root-mean-square residual (SRMR).

Our findings, presented in Table 7, indicate that the four-factor model provided a good fit to the data ($\chi^2=744.721$, $df=310$, $\chi^2/DF=2.402$, $TLI=0.916$,

$CFI=0.926$, $SRMR=0.0478$, $RMSEA=0.054$). All of the model fit indices met or exceeded generally accepted thresholds, in line with the recommendations [49]. Notably, CFI and TLI exceeded the 0.9 threshold, while CMIN/DF remained below 3. Additionally, RMSEA was less than 0.07 and the standardised RMR was less than 0.08, both of which are considered acceptable values. In contrast, alternative models, such as a one-factor model where all indicators load onto a single factor, exhibited poor fit to the data ($\chi^2=3156.920$, $df=321$, $\chi^2/DF=9.835$, $TLI=0.470$, $CFI=0.515$, $SRMR=0.1235$, $RMSEA=0.135$). Similarly, when integrating technology readiness and job crafting indicators into a single component, the model also showed a poor fit ($\chi^2=1872.268$, $df=315$, $\chi^2/DF=5.944$, $TLI=0.703$, $CFI=0.734$, $SRMR=0.1084$, $RMSEA=0.101$). These results underscore the uniqueness of the constructs related to TR, JC, BI, and CA, as well as the relevance of the control variables. As a result, we retained the four-factor model for further analysis, which was used to test our research hypotheses.

Results and discussion

This section presents and discusses the main findings of the study, which examined the relationships among technology readiness, career adaptability, and adapting behaviours (boundary integration and job crafting) among public sector workers in Ghana. The study also tested the mediating role of career adaptability in the

Table 6 HTMT analysis

	Technology readiness	Job crafting	Boundary integration	Career adaptability
Technology readiness				
Job crafting	0.385			
Boundary integration	0.303	0.313		
Career adaptability	0.468	0.653	0.366	

Table 7 Goodness-of-fit indices

Models	χ^2	df	χ^2/DF	TLI	CFI	SRMR	RMSEA
4 model 1 (including control variables)	744.721	310	2.402	0.916	0.926	0.0478	0.054
3 factor model 1 (combining T.R. & J.C.)	1872.268	315	5.944	0.703	0.734	0.1084	0.101
3 factor model 1 (combining TR & BI)	1519.259	315	4.823	0.771	0.794	0.0921	0.089
3 factor model 1 (combining JC & BI)	1468.946	315	4.663	0.780	0.803	0.0843	0.087
2 factor model 1 (combining TR & CA, JC & BI)	2257.927	320	7.056	0.636	0.669	0.1201	0.112
1 factor model 1	3156.920	321	9.835	0.470	0.515	0.1235	0.135

$N=484$

TLI/Tucker–Lewis index, CFI/comparative fit index, SRMR standardized root mean residual, RMSEA root-mean-square error of approximation, Chi-square χ^2 , TR technology readiness, JC job crafting, BI boundary integration, CA career adaptability

relationship between technology readiness and adapting behaviours. The study used covariance-based structural equation modelling (CB-SEM) to analyse the data collected from 484 respondents. The results showed that the four-factor model of the constructs provided a good fit to the data, and all the hypotheses were supported. The results are presented in Tables 8 and 9.

Direct effects

The analysis revealed a positive and significant relationship between technology readiness and career adaptability ($\beta=0.340, p=0.001, 95\% \text{ CI } [0.259, 0.424]$). This supports Hypothesis 1, indicating that individuals in the public sector who demonstrate a higher propensity to adopt and utilise new technologies tend to exhibit greater career adaptability. This association underscores the role of technology readiness in equipping public sector employees with the necessary skills and mindset to navigate their career paths effectively. The ability to engage with emerging technologies correlates with enhanced digital literacy, autonomous learning capabilities, and a flexible approach to workplace changes. These findings align with the literature that posits technology readiness as a catalyst for career adaptability, as evidenced by prior studies [1, 72], which highlight the importance of embracing technological advancements for professional growth and development.

Further examination of the data yielded evidence that career adaptability exerts a positive and significant

influence on both boundary integration behaviours ($\beta=0.314, p=0.002, 95\% \text{ CI } [0.162, 0.478]$) and job crafting behaviours ($\beta=0.551, p=0.001, 95\% \text{ CI } [0.415, 0.693]$). These findings lend support to Hypotheses 2a and 2b. The implications of these results are profound. They suggest that individuals who proactively develop skills to navigate career transitions and challenges are also more adept at integrating their work and personal life domains and tailoring their job roles to align with their personal strengths and career aspirations. This resonates with the notion that career adaptability not only facilitates better work-life synergy but also empowers employees to reshape their work environment to better suit their individual needs and objectives. Consistent with the assertions [14, 17], the study underscores career adaptability as a cornerstone for providing psychological resources, namely concern, control, curiosity, and confidence. These resources are instrumental in enabling workers to effectively manage their professional and personal lives, thereby enhancing overall job satisfaction and well-being.

The study further proved that technology readiness significantly enhances both boundary integration behaviours ($\beta=0.088, p=0.028, 95\% \text{ CI } [0.022, 0.171]$) and job crafting behaviours ($\beta=0.139, p=0.008, 95\% \text{ CI } [0.056, 0.222]$). These findings affirm hypotheses 3a and 3b, illustrating a clear linkage between an individual's technological optimism and innovative outlook and their propensity to engage in adaptive workplace behaviours. Specifically,

Table 8 Direct relationships

	B-estimate	S.E	C.R	95% Confidence interval for β		p values	Supported/rejected
				Lower	Upper		
TR → CA (H1)	0.340**	0.038	8.949	0.273	0.411	0.001	Supported
CA → BI (H2a)	0.314**	0.072	4.339	0.178	0.441	0.002	Supported
CA → JC (H2b)	0.551**	0.063	8.801	0.439	0.673	0.001	Supported
TR → JC (H3a)	0.088**	0.034	2.586	0.022	0.171	0.028	Supported
TR → BI (H3b)	0.139**	0.049	2.826	0.056	0.222	0.008	Supported

TR technology readiness, CA Career adaptability, BI Boundary integration, JC Job crafting

Significant at $p < 0.05$

Table 9 Indirect relationships

	B-estimate	S.E	C.R	95% Confidence interval for β		p values	Supported/rejected
				Lower	Upper		
TR → CA → JC (H4)	0.345	0.038	9.145	0.265	0.431	.001	Supported
TR → CA → BI (H5)	0.340	0.038	8.985	0.258	0.423	.001	Supported

TR Technology readiness, CA Career adaptability, JC Job crafting, BI Boundary integration

Significance level of a 2-tailed test for lower (2.5%) and upper (97.5%) bounds

the data indicate that workers with a positive orientation towards technology are more inclined to establish connections with external stakeholders and proactively modify their work tasks, skills, relationships, and perspectives to better suit their evolving professional landscape. This is consistent with the notion that TR serves as a channel for boundary integration and job crafting, equipping individuals with the technological tools and opportunities necessary for enhanced communication, collaboration, and innovation. This aligns with the earlier insights [15, 39], which posit that technological readiness is instrumental in providing the means through which individuals can effectively navigate and mould their work environment to promote both personal and organisational growth (Fig. 2).

Indirect effects

In testing for the mediation effects, an examination of the path directions and significance was done. The study followed the segmentation mediation procedure [92]. The segmentation method requires three sets of hypotheses. First, an independent construct predicts the mediator. Then, the second hypothesis states how the mediator impacts the outcome construct (*Y*). The third and final hypothesis looks at how *M* mediates between the *X* and *Y* relationships. Accordingly, to test for the mediation effect in the study, five conditions were examined: (a) the

influence of adaptive readiness (TR) on CA, (b) the effect of CA on adapting behaviours (BI and JC). The last two conditions, which are at the core of the mediation process, were to establish first if: (d) CA mediated the relationship between TR and the adapting behaviours. We tested the indirect effect of TR on BI and JC through career adaptability.

The study found that career adaptability indirectly influences the positive impact of technology readiness on job crafting ($\beta=0.345, p=0.001, 95\% \text{ CI } [0.162, 0.478]$). In other words, career adaptability acts as a bridge, translating individuals' willingness and ability to embrace technology into proactive coping strategies for career changes and challenges. Similarly, TR's impact on boundary integration ($\beta=0.340, p=0.001, 95\% \text{ CI } [0.022, 0.171]$) is also indirectly influenced by career adaptability. Workers who exhibit higher TR levels are better equipped to navigate the boundaries between work and personal life, thanks to their enhanced adaptability. Career adaptability serves as a critical bridge, connecting TR with adaptive behaviours. It transforms technological readiness into practical preparedness, enabling individuals to proactively manage their careers. Furthermore, career adaptability amplifies TR's positive effects on both boundary integration and job crafting. By fostering psychological resources (such as concern, control, curiosity, and confidence), career adaptability empowers workers

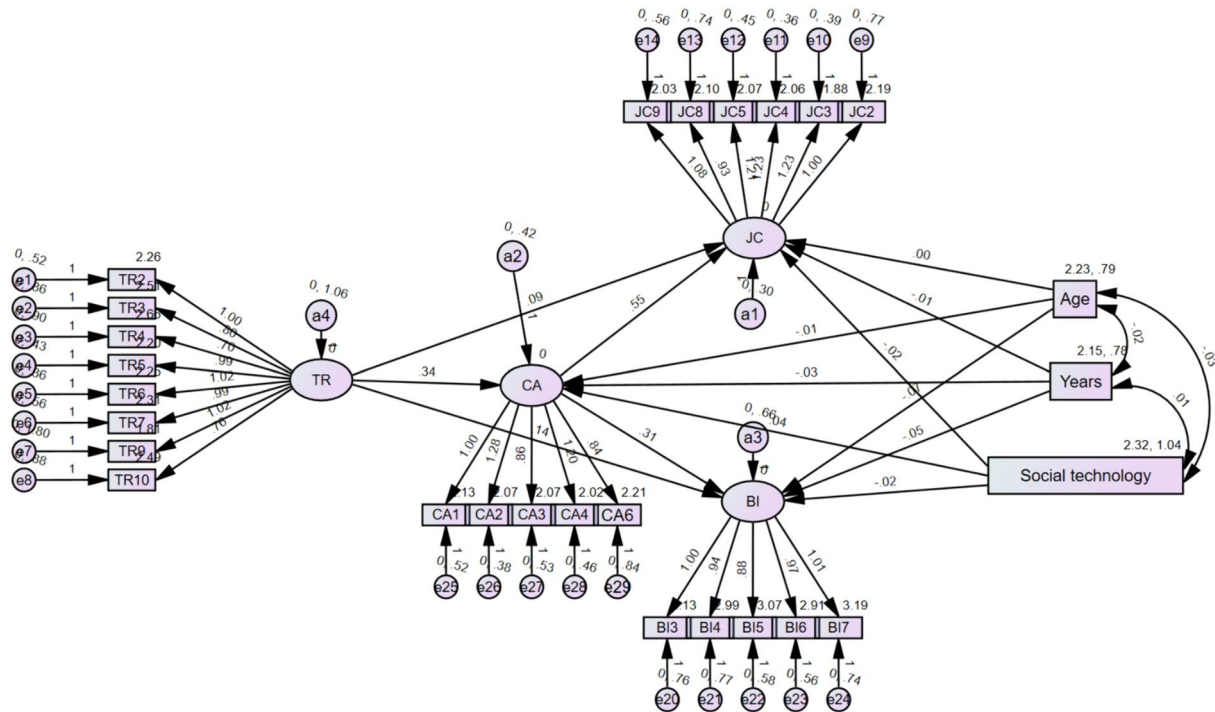


Fig. 2 Path model for the hypothesized direct paths

to thrive in dynamic work environments. Our findings align with the Career Construction Model of Adaptation [95]. This model posits that the interconnection of adaptive readiness, adaptability resources, and adapting responses leads to successful career adaptation. In sum, career adaptability emerges as a pivotal factor, bridging the gap between technological readiness and adaptive behaviours. Organisations and individuals alike can leverage this insight to foster resilience, agility, and career success in an ever-evolving landscape (Figs. 3, 4).

Control variables

The study’s results, summarized in Table 10, showed that control variables did not significantly affect the main construct of the study. The impact of social technology (ST) on career adaptability was statistically insignificant ($\beta=0.045, p=0.138$). Age and years of experience had statistically insignificant effects on career adaptability, job crafting, and boundary integration. For instance, age had a non-significant negative effect on job crafting

($\beta=-0.003, p=0.939$). ST also had no significant effect on job crafting and boundary integration. This study found no link between ST use and career adaptability, job crafting, and boundary integration, unlike previous research that showed ST can boost career development and work-life balance [23, 33]. This may be because the sample mainly included middle-level and staff employees who used ST less or differently for career purposes. The study showed no impact of age or tenure on career adaptability, job crafting, and boundary integration. An indication that these career constructs may depend on other factors like personality, motivation, values, and support, not on chronological or career age. This agrees with the career construction theory [98], which says individuals shape their careers based on their self-concepts and life themes, not on their objective features or conditions.

Implications of research

The results of this study have several implications for theory and practice.

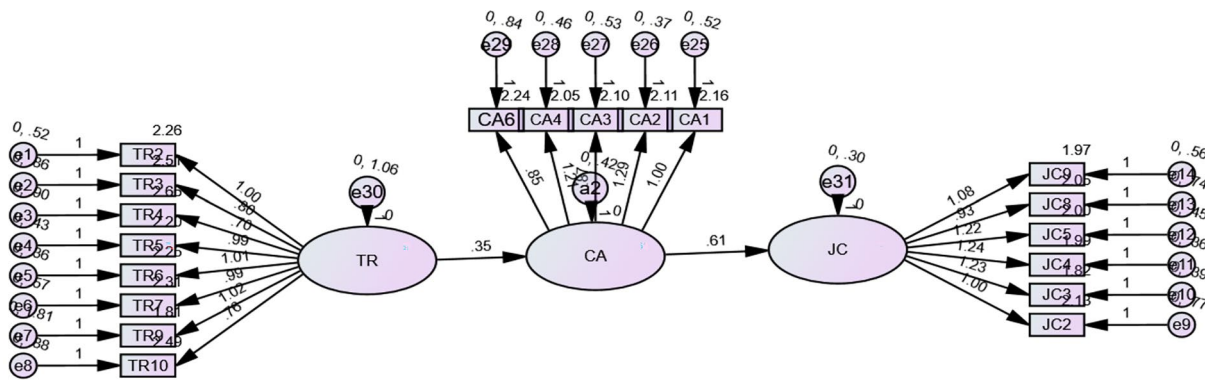


Fig. 3 Indirect structural model pathway

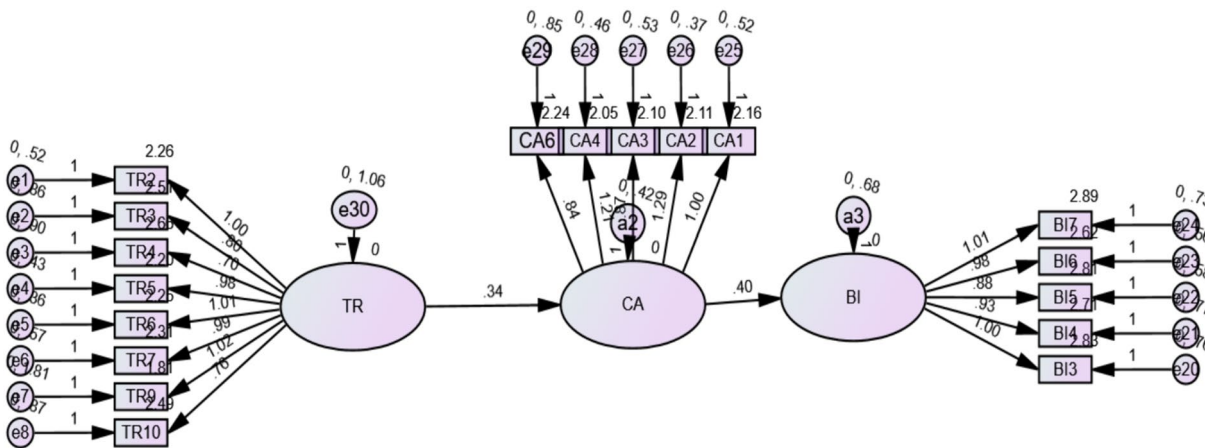


Fig. 4 Indirect structural model pathway

Table 10 Effects of control variables on main variables

	B-estimate	S.E	C.R	P	95% Confidence interval for β	
					Lower	Upper
Age employees → Career adaptability	-.009	.037	-.236	.798	-.071	.051
Years of experience → Career adaptability	-.025	.037	-.684	.488	-.081	.036
Social technology → Career Adaptability	.045	.032	1.385	.138	-.004	.099
Age of employees → Job crafting	-.003	.032	-.101	.939	-.048	.046
Age of employees → Boundary Integration	-.072	.046	-1.554	.121	-.150	.005
Years of experience → Job Crafting	-.008	.032	-.264	.834	-.061	.045
Years of experience → Boundary integration	-.047	.047	-1.016	.325	-.117	.029
Social technology → Job crafting	-.020	.028	-.702	.435	-.066	.023
Social technology → Boundary Integration	-.019	.040	-.460	.680	-.089	.053

**The regression coefficient is significant at 0.05

Theoretical implications

This study enriches the existing literature by elucidating the nuanced interplay between technology readiness, career adaptability, and adapting behaviours in the public sector. It underscores the pivotal role of career adaptability as a mediating factor, offering a comprehensive understanding of how employees in developing countries respond to technological advancements. The findings advocate for a more dynamic view of career development, emphasising the importance of adaptability in the face of rapid digital transformation. This research also extends the CCMA, providing empirical evidence from a non-Western context and highlighting the model's global applicability.

Practical implications

The insights from this study have significant practical implications for policymakers and organisational leaders in developing countries. By demonstrating the positive impact of technology readiness on career adaptability and adapting behaviours, the findings suggest that investments in technology infrastructure and training can foster a more adaptable and proactive workforce. Organisations are encouraged to create environments that support continuous learning and skill development, enabling employees to navigate the challenges of digitalisation effectively. Additionally, the study highlights the need for tailored strategies that consider the unique context of developing economies, ensuring that technological advancements translate into tangible career growth opportunities for individuals.

Implications for workers

In the context of Ghana's public sector, the implications of technology readiness on the workforce are multifaceted. As digital tools become increasingly integral to

operational efficiency, it is imperative that employees not only accept but also actively engage with these technologies to drive productivity and foster innovation. Concurrently, there is a pressing need for skill development; workers must receive regular training to remain abreast of rapid technological changes. This evolution of the workplace also means that job roles are likely to transform, necessitating a high degree of adaptability and a forward-thinking approach to career progression. To support these transitions, organisations must provide robust support through policies and resources that encourage continuous learning and adaptability in job functions. This holistic approach will ensure that the workforce remains competent and competitive in an ever-evolving technological landscape.

Conclusion

We sought to examine the impact of technology readiness on career adaptability and adapting behaviours among public sector workers in Ghana. The study found that technology readiness had a positive effect on career adaptability, boundary integration, and job crafting behaviours. Moreover, career adaptability indirectly influenced the relationship between technology readiness and adapting behaviours. The study contributes to the literature on career development and adaptation in the context of technological transformation. Overall, our findings provided strong support for the mediation model we proposed, confirming the significance of personality traits in the workplace.

Limitations and future directions

This study, while comprehensive, has certain limitations that open avenues for future research. The current research was limited to public sector employees in Ghana, which may not fully capture the diverse

experiences of workers in different sectors or cultural contexts. Future studies could expand the scope to include private sector employees and other countries to compare and contrast the findings. In addition, while this study focused on technology readiness and career adaptability, other potential variables could further enrich our understanding. Future research might explore the role of individual differences such as personality traits, emotional intelligence, and resilience in shaping technology adoption and career adaptability [89]. The impact of organisational culture, leadership styles, and support systems on employees' adapting behaviours in response to technological change also warrants investigation [76]. Moreover, longitudinal studies could provide insights into how these relationships evolve over time, particularly as technological advancements continue to accelerate. Investigating the long-term effects of technology readiness on career outcomes would be particularly valuable in predicting and preparing for future workforce trends. Lastly, the rapid pace of technological innovation suggests that future research should consider the implications of emerging technologies, such as artificial intelligence and automation, on career adaptability and employee behaviour [55]. Understanding these dynamics can help organisations better support their employees through transitions and ensure a future-ready workforce.

Abbreviations

TR	Technology readiness
CA	Career adaptability
BI	Boundary integration
JC	Job crafting
CCMA	Career Construction Model of Adaptation

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s43093-024-00355-z>.

Supplementary Material 1
Supplementary Material 2

Acknowledgements

Not applicable.

Author contributions

EK was involved in writing—conceptualisation, original draft, data curation, methodology, formal analysis, and interpretation of data of: "The Impact of Technology Readiness on Adapting Behaviours in the Workplace: A Mediating Effect of Career Adaptability". HVO contributed to supervision, conceptualisation, data curation, review and editing; SA was involved in writing—review and editing; AY contributed to editing, analysis, and review.

Funding

The authors received no funding.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The questionnaire included a statement that guaranteed the participants' privacy regarding their input for this paper.

Consent for publication

Not applicable.

Competing interests

The paper's findings were not influenced by any competing interests or personal relationships that the authors have.

Received: 10 February 2024 Accepted: 28 May 2024

Published online: 12 June 2024

References

- Abdul Hamid R (2022) The role of employees' technology readiness, job meaningfulness and proactive personality in adaptive performance. *Sustainability* 14:15696. <https://doi.org/10.3390/su142315696>
- Affum-Osei E, Antwi CO, Abdul-Nasiru I, Asante EA, Aboagye MO, Forkouh SK (2021) Career adapt-abilities scale in Ghana: psychometric properties and associations with individual-level ambidexterity and employees' service performance. *Curr Psychol* 40:4647–4662. <https://doi.org/10.1007/s12144-019-00406-7>
- Agbeko M, Effah J, Boateng R (2021) Digital transformation initiative in a public sector organization: stakeholder viewpoints and responses in Ghana. <https://hdl.handle.net/10125/70879978-0-9981331-4-0>
- Ahmed W (2023) Understanding self-directed learning behavior towards digital competence among business research students: SEM-neural analysis. *Educ Inf Technol* 28:4173–4202. <https://doi.org/10.1007/s10639-022-11384-y>
- Akkermans J, Paradniké K, Van Der Heijden BI, De Vos A (2018) The best of both worlds: the role of career adaptability and career competencies in students' well-being and performance. *Front Psychol*. <https://doi.org/10.3389/fpsyg.2018.01678>
- Alketbi S, Alshurideh M (2023) Impact of workplace happiness on the employee creativity: a systematic review. In: Alshurideh M, Al Kurdi BH, Masa'deh R, Alzoubi HM, Salloum S (eds) *The effect of information technology on business and marketing intelligence systems*. *Studies in computational intelligence*, vol 1056. Springer, Cham. https://doi.org/10.1007/978-3-031-12382-5_141
- Almemari M, Khalid K, Osman A (2023) How career adaptability influences job embeddedness of self-initiated expatriates? The mediating role of job crafting. *Cogent Bus Manag* 10:2220201. <https://doi.org/10.1080/23311975.2023.2220201>
- Anderson JC, Gerbing DW (1988) Structural equation modeling in practice: a review and recommended two-step approach. *Psychol Bull* 103(3):411. <https://doi.org/10.1037/0033-2909.103.3.411>
- Asher SR (1983) Social competence and peer status: recent advances and future directions. *Child Dev*. <https://doi.org/10.2307/1129805>
- Ayakwah A, Damoah IS, Osabutey EL (2021) Digitalization in Africa: the case of public programs in Ghana. *Business in Africa in the Era of Digital Technology: Essays in Honour of Professor William Darley*, 7–25. https://doi.org/10.1007/978-3-030-70538-1_2
- Bandura A (2023) *Social cognitive theory: an agentic perspective on human nature*. Wiley, Hoboken
- Bawole JN, Langnel Z (2023) Administrative reforms in the Ghanaian public services for government business continuity during the COVID-19 crisis. *Public Org Rev* 23:181–196. <https://doi.org/10.1007/s11115-022-00687-w>
- Berg JM, Wrzesniewski A, Dutton JE (2010) Perceiving and responding to challenges in job crafting at different ranks: When proactivity requires adaptivity. *J Org Behav* 31(2–3):158–186. <https://doi.org/10.1002/job.645>
- Berg JM, Dutton JE, Wrzesniewski A (2013) Job crafting and meaningful work. <https://doi.org/10.1037/14183-005>

15. Blut M, Wang C (2020) Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage. *J Acad Mark Sci* 48:649–669. <https://doi.org/10.1007/s11747-019-00680-8>
16. Bouckennooghe D, De Clercq D, Naseer S, Syed F (2022) A curvilinear relationship between work engagement and job performance: the roles of feedback-seeking behavior and personal resources. *J Bus Psychol* 37:353–368. <https://doi.org/10.1007/s10869-021-09750-7>
17. Brough P, Timms C, Chan XW, Hawkes A, Rasmussen L (2020) Work–life balance: definitions, causes, and consequences. *Handbook of socio-economic determinants of occupational health: from macro-level to micro-level evidence*, pp 473–487. https://doi.org/10.1007/978-3-030-31438-5_20
18. Bulger CA, Hoffman ME (2018) Segmentation/integration of work and nonwork domains: global considerations. <https://doi.org/10.1017/9781108235556.038>
19. Chen H, Fang T, Liu F, Pang L, Wen Y, Chen S, Gu X (2020) Career adaptability research: a literature review with scientific knowledge mapping in web of science. *Int J Environ Res Public Health* 17:5986. <https://doi.org/10.3390/ijerph17165986>
20. Cobb HR, Murphy LD, Thomas CL, Katz IM, Rudolph CW (2022) Measuring boundaries and borders: a taxonomy of work–nonwork boundary management scales. *J Vocat Behav* 137:103760. <https://doi.org/10.1016/j.jvb.2022.103760>
21. Coetzee M, Mbiko HN, Nel E (2023) To what extent do career agility and psychological capital activate employees' career adaptability and foster their career resilience and career satisfaction? *S Afr J Psychol* 53:438–451. <https://doi.org/10.1177/00812463231186271>
22. Conley CA, Zheng W (2009) Factors critical to knowledge management success. *Adv Dev Hum Resour* 11:334–348. <https://doi.org/10.1177/1523422309338159>
23. Coursera (2023). Work-life balance: what it is and 5 ways to improve yours. Coursera. Accessed 17 December 2023. <https://www.coursera.org/articles/work-life-balance>
24. Cronbach LJ, Shavelson RJ (2004) My current thoughts on coefficient alpha and successor procedures. *Educ Psychol Meas* 64(3):391–418. <https://doi.org/10.1177/0013164404026>
25. Damerji H, Salimi A (2021) Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting. *Acc Educ* 30:107–130. <https://doi.org/10.1080/09639284.2021.1872035>
26. Debus ME, Gross C, Kleinmann M (2020) The power of doing: how job crafting transmits the beneficial impact of autonomy among overqualified employees. *J Bus Psychol* 35:317–331
27. Deci EL, Ryan RM (2012) Self-determination theory. *Handb Theor Soc Psychol* 1:416–436
28. Delle E, Searle B (2022) Career adaptability: the role of developmental leadership and career optimism. *J Career Dev* 49:269–281. <https://doi.org/10.1177/0894845320930286>
29. Demuyakor J (2021) Ghana's digitization initiatives: a survey of citizens perceptions on the benefits and challenges to the utilization of digital governance services. *Int J Publ Soc Stud* 6:42–55. <https://doi.org/10.18488/Journal.135.2021.61.42.55>
30. Di Maggio I, Montenegro E, Little TD, Nota L, Ginevra MC (2022) Career adaptability, hope, and life satisfaction: an analysis of adults with and without substance use disorder. *J Happiness Stud* 23:439–454. <https://doi.org/10.1007/s10902-021-00405-1>
31. Diaa NM, Abidin AZU, Roller M (2024) Examining the relationship of career crafting, perceived employability, and subjective career success: the moderating role of job autonomy. *Future Bus J* 10:16. <https://doi.org/10.1186/s43093-024-00304>
32. Duan SX, Deng H, Wibowo S (2023) Exploring the impact of digital work on work–life balance and job performance: a technology affordance perspective. *Inf Technol People* 36:2009–2029. <https://doi.org/10.1108/ITP-01-2021-0013>
33. Duan SX, Deng H, Wibowo S (2024) Technology affordances for enhancing job performance in digital work. *J Comput Inf Syst* 64:232–244. <https://doi.org/10.1080/08874417.2023.2188497>
34. Dutton JE, Wrzesniewski A (2020) What job crafting looks like. *Harvard Business Review*, Brighton
35. Federici E, Boon C, Den Hartog DN (2021) The moderating role of HR practices on the career adaptability–job crafting relationship: a study among employee–manager dyads. *Int J Hum Resour Manag* 32:1339–1367. <https://doi.org/10.1080/09585192.2018.1522656>
36. Ferreira N (2022) Career adaptability as a predictor of employees' career agility and career embeddedness. *Managing human resources: the new normal*. Springer, Berlin. <https://doi.org/10.1007/978-3-031-09803-113>
37. Fleming M, Clarke W, Das S, Phongthientham P, Reddy P (2019) The future of work: how new technologies are transforming tasks. MITIBM Watson AI Lab. <https://mitibmwatsonailab.mit.edu/wp-content/uploads/2020/02/The-Future-of-Work-How-New-Technologies-Are-Transforming-Tasks2.pdf>
38. Fornell C, Larcker DF (1981) Structural equation models with unobservable variables and measurement error: algebra and statistics. Sage Publications, Los Angeles, CA. <https://doi.org/10.1080/10705519909540118>
39. Ghanadmission (2021) List of government agencies and parastatals in Ghana. <https://ghanadmission.com/government-agencies-and-parastatals-in-ghana/>. Accessed 1/4/2024
40. Gonçalves AP, Martins GH, Salvador AP, Machado GM, Carvalho LDF, Ambiel RAM (2021) Career adaptability and associations with personality traits and pathological traits utilizing network analysis. *Int J Educ Vocat Guid* 21:379–394. <https://doi.org/10.1007/s10775-020-09448-x>
41. Gong Z, Gilal FG, Gilal NG, Van Swol LM, Gilal RG (2023) A person-centered perspective in assessing career adaptability: potential profiles, outcomes, and antecedents. *Eur Manag J* 41:415–424. <https://doi.org/10.1016/j.emj.2022.03.009>
42. Green ZA, Yıldırım M, Jalal R (2023) Testing the career construction model of adaptation in a sample of Afghanistan's working adults: a longitudinal study. *J Career Assess* 31:50–67. <https://doi.org/10.1177/1069072722110842>
43. GSS (2023) Ghana 2022 earnings, inequality in the public sector. <https://statsghana.gov.gh/searchread.php?searchfound=Nzg50Dk1MjExODYuODY1/search/rr7nr9458n>
44. Hair JF, Black WC, Babin BJ (2010) *Multivariate data analysis*. Prentice Hall, Englewood Cliffs, NJ
45. Hair JF, Ringle CM, Sarstedt M (2011) PLS-SEM: indeed a silver bullet. *J Mark Theory Pract* 19(2):139–152. <https://doi.org/10.2753/MTP1069-6679190202>
46. Harry N, Malepane T (2021) Gender and emotional intelligence as predictors of career adaptability in the Department of Water and Sanitation in South Africa. *SA J Ind Psychol* 47(1):1–7. <https://doi.org/10.4102/sajip.v47i0.1828>
47. Henseler J, Ringle CM, Sarstedt M (2015) A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J Acad Mark Sci* 43:115–135. <https://doi.org/10.1007/s11747-014-0403-8>
48. Hlado P, Juhaňák L, Hloušková L, Lazarová B (2022) Exploring the roles of career adaptability, self-esteem, and work values in life satisfaction among emerging adults during their career transition. *Emerg Adulthood* 10:135–148. <https://doi.org/10.1177/2167696821101258>
49. Hu LT, Bentler PM (1999) Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Model: A Multidiscip Journal* 6(1):1–55. <https://doi.org/10.1080/10705519909540118>
50. Irfan SM, Qadeer F, Sarfraz M, Bhutta MK (2023) Determinants and consequences of job crafting under the boundary conditions of work uncertainty. *Career Dev Int* 28(6/7):686–705
51. Jiang R, Fan R, Zhang Y, Li Y (2022) Understanding the serial mediating effects of career adaptability and career decision-making self-efficacy between parental autonomy support and academic engagement in Chinese secondary vocational students. *Front Psychol* 13:953550. <https://doi.org/10.3389/fpsyg.2022.953550>
52. Jilke S (2021) Measuring technological uncertainty and technological complexity: scale development and an assessment of reliability and validity. *Int J Innov Sci* 13:381–400. <https://doi.org/10.1108/IJIS-08-2020-0120>
53. Johnson S (2016) Adapt or die: why career adaptability is vital to your success. Retrieved August, 11, 2016. <https://www.aim.com.au/blog/adapt-or-die-why-career-adaptability-vital-your-success>

54. Kahfi F (2022) Exploring the impact of digital technology on employee adaptation and organizational performance. *J Manag Admin Provis* 2:37–43. <https://doi.org/10.55885/jmap.v2i2.183>
55. Kara A (2024) Empirical investigation of the career construction model of adaptation. *Anatol J Educ* 9:195–214. <https://doi.org/10.29333/aje.2024.9114a>
56. Kara A, Orum-Çattik E, Eryılmaz A (2022) Adaptivity, adaptability, adapting response, and adaptation result: testing with structural equation modelling on pre-service teachers. *Curr Psychol* 41:4171–4182. <https://doi.org/10.1007/s12144-021-01975-2>
57. Kaur H, Kaur R (2021) Career adaptability and job outcomes: a moderated mediation model of proactivity and job content plateau in educational sector. *High Educ Skills Work Based Learn* 11:929–945. <https://doi.org/10.1108/HESWBL-07-2020-0150>
58. Kline RB (2015) The mediation myth. *Basic Appl Soc Psychol* 37:202–213. <https://doi.org/10.1080/01973533.2015.1049349>
59. Korkmaz O (2023) Will hope and career adapt-abilities bring students closer to their career goals? An investigation through the career construction model of adaptation. *Curr Psychol* 42:2243–2254. <https://doi.org/10.1007/s12144-022-02932-31>
60. Kossek EE, Perrigino M, Rock AG (2021) From ideal workers to ideal work for all: a 50-year review integrating careers and work-family research with a future research agenda. *J Vocat Behav* 126:103504. <https://doi.org/10.1016/j.jvb.2020.103504>
61. Kossek EE, Ruderman MN, Braddy PW, Hannum KM (2012) Work–non-work boundary management profiles: a person-centered approach. *J Vocat Behav* 81:112–128. <https://doi.org/10.1016/j.jvb.2012.04.003>
62. Krejcie RV, Morgan DW (1970) Determining sample size for research activities. *Educ Psychol Meas* 30:607–610. <https://doi.org/10.1177/001316447003000308>
63. Kumbeni MT, Apanga PA, Chanase M-AW, Alem JN, Mireku-Gyimah N (2021) The role of the public and private health sectors on factors associated with early essential newborn care practices among institutional deliveries in Ghana. *BMC Health Serv Res* 21:1–8. <https://doi.org/10.1186/s12913-021-06665-0>
64. Kundi YM, Hollet-Haudebert S, Peterson J (2022) Career adaptability, job crafting and subjective career success: the moderating roles of lone wolf personality and positive perfectionism. *Pers Rev* 51:945–965. <https://doi.org/10.1108/PR-04-2020-0260>
65. Lan Y, Chen Z (2020) Transformational leadership, career adaptability, and work behaviors: the moderating role of task variety. *Front Psychol* 10:2922. <https://doi.org/10.3389/fpsyg.2019.02922>
66. Li L (2022) Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond. *Inf Syst Front*. <https://doi.org/10.1007/s10796-022-10308-y>
67. Lodi E, Zammitti A, Magnano P, Patrizi P, Santisi G (2020) Italian adaption of self-perceived employability scale: psychometric properties and relations with the career adaptability and well-being. *Behav Sci* 10:82. <https://doi.org/10.3390/bs10050082>
68. Luna-Reyes LF (2023) Beth Kanter & Allison Fine: The smart nonprofit: staying human-centered in an automated world: Wiley, Hoboken, NJ, 2022, 216 pp, \$20.30 (Bibliography, Index). Springer, Berlin. <https://doi.org/10.1007/s11266-022-00542-y>
69. Maggiori C, Rossier J, Savickas ML (2017) Career adaptabilities scale-short form (CAAS-SF) construction and validation. *J Career Assess* 25:312–325. <https://doi.org/10.1177/1069072714565856>
70. Marconetti J, Rossier J (2021) A longitudinal study of relations among adolescents' self-esteem, general self-efficacy, career adaptability, and life satisfaction. *J Career Dev* 48:475–490. <https://doi.org/10.1177/0894845319861691>
71. Marin VI, Castaneda L (2023) Developing digital literacy for teaching and learning. *Handbook of open, distance and digital education*. Springer, Berlin. https://doi.org/10.1007/978-981-19-2080-6_64.pdf
72. Mc Loughlin E, Priyadarshini A (2021) Adaptability in the workplace: investigating the adaptive performance job requirements for a project manager. *Proj Leadersh Soc* 2:100012. <https://doi.org/10.1016/j.plas.2021.100012>
73. Nayak B, Bhattacharyya SS, Krishnamoorthy B (2021) Explicating the role of emerging technologies and firm capabilities towards attainment of competitive advantage in health insurance service firms. *Technol Forecast Soc Change* 170:120892. <https://doi.org/10.1016/j.techfore.2021.120892>
74. Nunnally J (1994) Psychometric theory
75. Nzuva SM, Kimanzi PM (2022) The impact of organisational culture on employees' productivity: a comprehensive systematic review. *Eur J Bus Manag* 14:42–55. <https://doi.org/10.7176/EJBM/14-4-05>
76. OECD (2019) Digitisation and productivity: a story of complementarities. Organisation for Economic Co-Operation and Development (OECD), Paris
77. Ohemeng FL, Akonnor A (2023) The new public sector reform strategy in Ghana: creating a new path for a better public service? *Public Org Rev* 23:839–855. <https://doi.org/10.1007/s11115-021-00600-x>
78. Öztemel K, Akyol EY (2021) From adaptive readiness to adaptation results: implementation of student career construction inventory and testing the career construction model of adaptation. *J Career Assess* 29:54–75. <https://doi.org/10.1177/10690727209306>
79. Pajic S, Keszler Á, Kismihók G, Mol ST, Den Hartog DN (2018) Antecedents and outcomes of Hungarian nurses' career adaptability. *Int J Manpow* 39:1096–1114. <https://doi.org/10.1108/IJM-10-2018-0334>
80. Parasuraman A (2000) Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *J Serv Res* 2(4):307–320. <https://doi.org/10.1177/10946705002400>
81. Parasuraman A, Colby CL (2015) An updated and streamlined technology readiness index: TRI 2.0. *J Serv Res* 18(1):59–74. <https://doi.org/10.1177/109467051453973>
82. Peng P, Song Y, Yu G (2021) Cultivating proactive career behavior: the role of career adaptability and job embeddedness. *Front Psychol* 12:603890. <https://doi.org/10.3389/fpsyg.2021.603890>
83. Petrou P, Demerouti E, Schaufeli WB (2018) Crafting the change: the role of employee job crafting behaviours for successful organizational change. *J Manag* 44:1766–1792. <https://doi.org/10.1177/0149206315624961>
84. Podsakoff PM, MacKenzie SB, Lee J-Y, Podsakoff NP (2003) Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol* 88(5):879. <https://doi.org/10.1037/0021-9010.88.5.879>
85. Reinke K, Gerlach GI (2022) Linking availability expectations, bidirectional boundary management behavior and preferences, and employee well-being: an integrative study approach. *J Bus Psychol* 37:695–715. <https://doi.org/10.1007/s10869-021-09768-x>
86. Richter F-J, Sinha G (2020) Why do your employees resist new tech? Harvard Business Review Home, 21. <https://hbr.org/2020/08/why-do-your-employees-resist-new-tech>
87. Rishi S, Breslau B, Miscovich P (2021) The workplace you need now: shaping spaces for the future of work. Wiley, Hoboken
88. Rogers W, Mitzner T, Boot W, Charness N, Czaja S, Sharit J (2017) Understanding individual and age-related differences in technology adoption. *Innov Aging* 1:1026. <https://doi.org/10.1093/geroni/igx004.3733>
89. Rossier J, Ginevra MC, Bollmann G, Nota L (2017) The importance of career adaptability, career resilience, and employability in designing a successful life. *Psychology of career adaptability, employability and resilience*, 65–82. https://doi.org/10.1007/978-3-319-66954-0_5
90. Rudolph CW, Lavigne KN, Zacher H (2017) Career adaptability: a meta-analysis of relationships with measures of adaptivity, adapting responses, and adaptation results. *J Vocat Behav* 98:17–34. <https://doi.org/10.1016/j.jvb.2016.09.002>
91. Rungtusanatham M, Miller JW, Boyer KK (2014) Theorizing, testing, and concluding for mediation in SCM research: tutorial and procedural recommendations. *J Oper Manag* 32:99–113. <https://doi.org/10.1016/j.jom.2014.01.002>
92. Salim RMA, Istiasih MR, Rumlatur NA, Situmorang DDB (2023) The role of career decision self-efficacy as a mediator of peer support on students' career adaptability. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2023.e14911>
93. Savickas ML (2005) The theory and practice of career construction. *Career Dev Couns: Putt Theory Res Work* 1:42–70
94. Savickas ML, Porfeli EJ (2012) Career adapt-abilities scale: construction, reliability, and measurement equivalence across 13 countries. *J Vocat Behav* 80:661–673. <https://doi.org/10.1016/j.jvb.2012.01.011>

95. Savickas ML (2013) Career construction theory and practice. *Career Dev Counsel Putting Theory Res Work* 2:144–180
96. Savickas ML, Porfeli EJ, Hilton TL, Savickas S (2018) The student career construction inventory. *J Vocat Behav* 106:138–152. <https://doi.org/10.1016/j.jvb.2018.01.009>
97. Slempong GR, Zhao Y, Hou H, Vallerand RJ (2021) Job crafting, leader autonomy support, and passion for work: testing a model in Australia and China. *Motiv Emot* 45(1):60–74
98. Sony M, Mekoth N (2022) Employee adaptability skills for Industry 4.0 success: a road map. *Prod Manuf Res* 10:24–41. <https://doi.org/10.1080/21693277.2022.2035281>
99. Sora B, Caballer A, García-Buades E (2018) Validation of a short form of Job Crafting Scale in a Spanish sample. *Span J Psychol* 21:E51. <https://doi.org/10.1017/sjp.2018.52>
100. Storme M, Celik P, Myszkowski N (2020) A forgotten antecedent of career adaptability: a study on the predictive role of within-person variability in personality. *Person Individ Differ* 160:109936. <https://doi.org/10.1016/j.paid.2020.109936>
101. Struminskaya B, Gummer T (2022) Risk of nonresponse bias and the length of the field period in a mixed-mode general population panel. *J Surv Stat Methodol* 10:161–182. <https://doi.org/10.1093/jssam/smab011>
102. Taber BJ (2019) Career counselling interventions to enhance career adaptabilities for sustainable employment. In: *Handbook of innovative career counselling*, pp 103–115
103. Tandiyuk S, Bellani E, Susanto AF, Firmansyah F (2022) The effectiveness of career adaptability training for final year students. *Jurnal Manajemen Bisnis* 9:215–220. <https://doi.org/10.33096/jmb.v9i1.137>
104. Tims M, Bakker AB (2010) Job crafting: towards a new model of individual job redesign. *SA J Ind Psychol* 36:1–9
105. Tims M, Bakker AB, Derks D (2012) Development and validation of the job crafting scale. *J Vocat Behav* 80:173–186. <https://doi.org/10.1016/j.jvb.2011.05.009>
106. Tokar DM, Savickas ML, Kaut KP (2020) A test of the career construction theory model of adaptation in adult workers with Chiari malformation. *J Career Assess* 28:381–401. <https://doi.org/10.1177/1069072719867733>
107. Voordt TVD, Jensen PA (2023) The impact of healthy workplaces on employee satisfaction, productivity and costs. *J Corp Real Estate* 25:29–49. <https://doi.org/10.1108/JCRE-03-2021-0012>
108. Wang H-J, Demerouti E, Le Blanc P (2017) Transformational leadership, adaptability, and job crafting: the moderating role of organizational identification. *J Vocat Behav* 100:185–195. <https://doi.org/10.1016/j.jvb.2017.03.009>
109. Wen Y, Liu F, Pang L, Chen H (2022) Proactive personality and career adaptability of Chinese female pre-service teachers in primary schools: the role of calling. *Sustainability* 14:4188. <https://doi.org/10.3390/su14074188>
110. Weng Q, Zhu L (2020) Individuals' career growth within and across organizations: a review and agenda for future research. *J Career Dev* 47:239–248. <https://doi.org/10.1177/0894845320921951>
111. Wu G, Zhang L, Liu X, Liang Y (2023) How school principals' motivating style stimulates teachers' job crafting: a self-determination theory approach. *Curr Psychol* 42:20833–20848. <https://doi.org/10.1007/s12144-022-03147-2>
112. Yang X, Feng Y, Meng Y, Qiu Y (2019) Career adaptability, work engagement, and employee well-being among Chinese employees: the role of guanxi. *Front Psychol* 10:1029. <https://doi.org/10.3389/fpsyg.2019.01029>
113. Yasir M, Majid A (2019) Boundary integration and innovative work behavior among nursing staff. *Eur J Innov Manag* 22:2–22. <https://doi.org/10.1108/EJIM-02-2018-0035>
114. Yen H-C, Cheng J-W, Hsu C-T, Yen K-C (2023) How career adaptability can enhance career satisfaction: exploring the mediating role of person–job fit. *J Manag Organ* 29:912–929. <https://doi.org/10.1017/jmo.2019.75>
115. Yeo RK, Li J (2022) Blurring of boundaries between work and home: the role of developmental relationships in the future of work. In: Ghosh R, Hutchins HM (eds) *HRD perspectives on developmental relationships*. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-85033-3_13
116. Zhai C, Chai X, Shrestha S, Zhong N (2023) Grit and career construction among Chinese high school students: the serial mediating effect of hope and career adaptability. *Sustainability* 15:3608. <https://doi.org/10.3390/su15043608>
117. Zhang W, Guan X, Zhou X, Lu J (2019) The effect of career adaptability on career planning in reaction to automation technology. *Career Dev Int* 24:545–559. <https://doi.org/10.1108/CDI-05-2018-0135>
118. Zhang X-J, Savickas ML, Ma Y-D, Li C-J, Xue W-F, Wang R (2023) From adaptive readiness to adaptation results testing the career construction model of adaptation in Chinese adolescents. *J Career Assess*. <https://doi.org/10.1177/10690727231213810>
119. Zhao L, Li W, Zhang H (2022) Career adaptability as a strategy to improve sustainable employment: a proactive personality perspective. *Sustainability* 14(19):12889. <https://doi.org/10.3390/su141912889>

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.