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Digital knowmads competencies for a meaningful work

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BUSINESS
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Department of Human Resources and Organizational Behavior

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Resumo

O advento da transformação digital e do nomadismo digital trouxe consigo um enorme leque de oportunidades, mas também de desafios que podem dificultar a sua sustentabilidade enquanto nova configuração da força de trabalho. Estes desafios prendem-se com a necessidade de repensar as competências digitais e a forma de proporcionar um trabalho significativo nestes contextos. Além disso, existe um vazio quanto à forma como essas competências podem promover um trabalho com significado. As propostas atuais sobre a importância relativa dessas competências digitais divergem no que diz respeito à sua centralidade e a sua relação com o significado do trabalho tem sido quase inexistente. Este estudo tem como objetivo testar a importância relativa das competências digitais no fomento do trabalho com significado, com base na teoria da autodeterminação.

Com uma amostra de 253 nómadas digital, foi testado um modelo concetual simples que relaciona sete conjuntos de competências digitais, retiradas de três autores principais, para explicar o significado de trabalho auto-reportado. Os resultados mostram que todas as competências estão positivamente associadas a um trabalho com significado, com exceção das competências de autogestão e das de cibersegurança. Os resultados são discutidos à luz da teoria da autodeterminação e a sua contribuição para a teoria e a prática é explorada juntamente com sugestões para investigação futura neste domínio.

Palavras-chave: Nómadas digitais, competências digitais, trabalho com significado.

Classificação JEL

- M12 – Gestão de Pessoal
- M54 – Gestão do Trabalho

Abstract

The advent of digital transformation and digital nomadism brought with it a huge array of opportunities but also challenges that may hamper its sustainability as a new workforce setting. These concern the need to rethink digital skills as well as how to provide meaningful work in such contexts. Moreover, there is a void about how such skills can foster a sense of meaningful work. The current proposals on the relative importance of such digital skills diverge as regards which ones are more central and which ones more peripheral and its relationship with meaningful work has been almost inexistent. This study is designed to test the relative importance of digital skills in fostering meaningful work from a self-determination theory viewpoint.

With a sample of 253 digital knowmads, a straightforward conceptual model relating seven sets of digital skills taken from three main authors was tested to account for their self-reported sense of meaningful work. Findings show that all skills are positively associated with meaningful work to the exception of self-management skills and cybersecurity skills. Findings are discussed at the light of self-determination theory and its contribution to theory and practice explored together with suggestions for future research in this domain.

Keywords: Digital knowmads, Digital skills, Meaningful work.

JEL Classification

M12 – Personnel Management

M54 – Labor Management

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Glossary of Acronyms

CFA – Confirmatory Factor Analysis

CI – Confidence Interval

CMT – Common Method Test (Harman's test)

HTMT – Heterotrait-Monotrait Ratio of Correlations

ICT – Information and Communication Technology

ICS – Intercultural Skills

ISIC – International Standard Industrial Classification

KMO – Kaiser-Meyer-Olkin Measure of Sampling Adequacy

MLRA – Multiple Linear Regression Analysis

PCA – Principal Component Analysis

RMSEA – Root Mean Square Error of Approximation

SDT – Self-Determination Theory

SMS – Self-Management Skills

SRMR – Standardized Root Mean Square Residual

TLI – Tucker-Lewis Index

WAMI – Work as Meaning Inventory

WS – Work Skills

ES – Emotional Skills

DS – Digital Skills

Introduction

Digital nomads, also named as "knowmads" to highlight their higher qualification as knowledge workers, emerged in the latest years. They represent a transformation in the dynamics of the workforce, due to the macro level changes created by digital transformation ensuing the previous trend in deepening globalization (Mascheroni, 2007). It is today an understatement that digital nomadism is characterized by flexibility as regards location, schedule and even work content with the assumption that a high level of professionalism is expected from those willing to embrace this lifestyle.

More than flexibility, knowmads are expected to accept mobility, to guarantee their own autonomy in all dimensions (personal and work decisions and responsibilities), and to perform at a high level. A knowmad, as any knowledge worker, is expected to be adaptable not only in the knowledge required to perform tasks (e.g. the continuously updating coding languages) but also adaptable to fluid environments (Mascheroni, 2007; Müller, 2016) which was already highlighted at the early stages of the remote working and hybrid arrangements (Makimoto et al., 1997).

Digital nomadism poses distinctive challenges, including financial instability, maintaining a healthy work-life balance, and effective self-management within decentralized work environments (Makimoto, 2013; Bratianu et al., 2021). The accelerated expansion of digital nomadism has raised the demand for the identification of competencies required to manage these challenges effectively.

There are many proposals concerning which are the competencies that predict performance in a digital knowmad context (e.g. Audrin et al., 2024; Bratianu et al., 2021; Schulze & Krumm, 2017; Tramontano et al., 2021), but these proposals do not entirely converge among themselves although they do overlap substantially. As a unique contribution some of these proposals single out competencies such as cybersecurity (Audrin et al., 2024) and some are transversal to all proposals (e.g. Self-management skills) while others are almost uniquely proposed such as social skills (Tramontano et al., 2021). Still, the coexistence of divergent proposals is not necessarily an indication that the literature is in disarray, but it will suggest a possible lack of cumulative knowledge building. This is visible in the lack of mutual citation among some central papers in this topic. Among the most mentioned, one can find competencies

such as self-management, advanced ICT skills, trust-building, intercultural skills, social and emotional skills, and cybersecurity but with different levels of frequency.

Alongside this literature focused on competencies, there are many assumptions about which are the dependent variables that define positive outcomes for digital knowmads. Among the many possibilities, literature has been overlooking an important theme that is intrinsically linked to motivation: meaningful work.

Meaningful work is not only at the heart of the emerging flexible work arrangements that are claimed to bring better work-life balance (Rosso et al., 2010), that are expected to foster more well-being and happiness (Chalofsky, 2010) or simply to allow workers more freedom in work settings, precisely one of the claims of those that propose digital nomadism as a new – better – life style connecting work with travelling the world (Thompson, 2019). However, there is scarce knowledge about how the competencies enable or detract digital knowmads' construction of meaning at work, or better put, experience of having a meaningful work.

Therefore, currently, there is a substantial research gap in literature due to the lack of integration of such proposals, both concerning the disperse literature on competencies and the lack of knowledge about how these competencies contribute to a meaningful work amongst knowmads. Likewise, there are specific proposals that have important implications, if true, such as self-management and intercultural skills being the key competencies in these context (Bratianu et al., 2021) but most often competencies are proposed but their effectiveness as predictors is not empirically shown. This is the research gap that motivates this study.

Closing in this gap will facilitate the integration of literature while providing practical insights for HR professionals expected to support this changing workforce. Thus, this study is designed to answer the following question: What are the key competencies of digital knowmads that foster meaningful work?

One cannot neglect the ongoing changes in the world of work in the digital age because remote and flexible work models are gaining roots as new normal. So, the number of workers targeted by this study is no longer negligeable and is increasing by the day. From a theoretical perspective, the study links competency theory (Spencer & Spencer, 1993; Roe, 2002) with motivational theories such as Self-Determination Theory (Ryan & Deci, 2000) and the concept of meaningful work (Fairlie, 2010; Chalofsky, 2010).

All these theoretic topics have a rich and long history in organizational behavior and HRM research and by bringing them together with a novel work context that is crossed by technology there are plenty opportunities to revise and rethink some taken-for-granted findings or simply to test whether they stand in this new work context. To the managers and practitioners,

and to the knowmads themselves, findings from this study are potentially useful as regards defining hiring profiles, making a balance about one's own competencies and what can be done to leverage those that are falling short, and designing corporate policies intended to foster a meaningful work experience in those that embrace a nomadic lifestyle to attract and retain the best.

For this purpose, the thesis is designed to cover relevant literature starting by exploring the search for meaningful work and why this is an important topic. It will then expose the rise of digital nomadism, and which proposals have been found concerning the competencies required in such a context. It will then identify the most critical competencies for knowmads and integrate all the proposals into a conceptual model. After this, the methodological procedures will be shown with a focus on the data collection, sample, measures and data analysis options, to finally present findings, both the descriptive and bivariate statistics, which are subsidiary to show those concerning the hypotheses testing. The thesis ends with the discussion of results and conclusion highlighting the implications, limitations and future research.

CHAPTER 1

Literature review

This chapter will start by presenting the conceptual definition of meaningful work and its relationship with core motivational theory such as the classical authors, self-determination theory and its transposition to work settings such as exemplified with the job characteristics model. After this, digital nomadism is explored by showing how it has risen to become a central topic in modern work life, and research, and what are its features. It then introduces digital knowmads competencies, defining it and comparing some proposals that are partially converging to produce a set of hypotheses that comprise the conceptual model, also graphically present at the end of this chapter.

1.1 The search for meaningful work

The concept of meaningful work has become a prominent topic of discussion in academic and professional circles, due to its influence on individual and organizational well-being (Chalofsky, 2010). When people find meaning in their activities — whether at work, in personal relationships, or through personal pursuits — they tend to experience greater satisfaction, resilience, and fulfilment (Fairlie, 2011). Development is therefore essential to meaning. For HR professionals, this suggests that promoting meaningful work - characterized by elements that support individuals' sense of purpose and growth - could increase employee engagement (Fairlie, 2010).

While Bruner (1986) reasoned that meaning making is at the core of the human condition, turning it into the most critical feature of humankind, the contemporary workplace seems to be confronted with a prevalence of meaningless work. This phenomenon can be at the origin of a dearth of employee motivation and engagement (Rosso et al., 2010). This issue arises when employment rolls fail to provide a deeper sense of purpose or fulfilment, which results in employees becoming disconnected from the value of their work (Tan et al., 2023).

Meaningful work is defined as a job and other workplace characteristics that facilitate the attainment or maintenance of one or more dimensions of meaning, namely a sense of autonomy, competence, growth and contributing to others (Fairlie, 2010). According to this author, meaningful work encompasses key dimensions such as purpose, autonomy, mastery, and engagement, which collectively contribute to an employee's sense of fulfilment and their commitment to their role. This relates directly to self-determination theory by Ryan and Deci

(2010) which highlights the importance of autonomy, competence, and belongingness to produce high quality motivational states.

As outlined by Rosso et al. (2010) meaningful work is a fundamental aspect of an individual's personal fulfilment, well-being and engagement. When work lacks meaning, the consequences extend beyond individual dissatisfaction, impacting organizational productivity, employee retention and overall performance.

Meaningful work entails addressing core dimensions such as life purpose, autonomy, mastery, and engagement (Fairlie, 2010). These elements assist individuals in aligning their daily tasks with their values and goals, while also fostering a greater sense of control and ownership over their work. When employees perceive their work as meaningful, they are more likely to experience higher levels of motivation, creativity, and commitment to their roles (Chalofsky, 2010). Conversely, the absence of meaningful work can lead to a workforce that is disengaged and unmotivated, which in turn undermines the effectiveness of the organization (Bailey et al., 2016).

According to Ryff (2000), meaningful work contributes to the purpose and integrity of an individual's life. Baumeister (1991) and Maslow (1970) theories suggest that work should enable individuals to live according to their values and goals, while providing opportunities for personal growth and achievement. Employees who feel a sense of mastery and control over their work are more likely to be motivated and committed to achieving organizational goals. According to Baumeister (1991), there are four fundamental psychological needs that contribute to a meaningful life. The need for purpose involves having clear, long-term goals. It also involves a sense of direction for one's actions. The need for values (moral justification) involves perceiving one's behavior as morally justified and socially acceptable. Efficiency is described as a sense of competence. Finally, self-esteem is associated with a sense of value, respect, and positive attitude towards others. Together, these closely related needs form the basis for experiencing life as meaningful.

Pratt and Ashforth (2003) further propose two dimensions through which individuals experience meaningfulness in their work. The first is “meaning in working”, where tasks themselves hold intrinsic importance and contribute to broader goals. The second is “meaning at work”, which is based on interpersonal connections and a sense of belonging. These dimensions shape individuals' professional identity and enhance their overall sense of purpose. Recognizing and cultivating both task significance and workplace relationships are important for fostering meaningful work experiences.

Rosso et al. (2010) propose four pathways to meaningful work, structured along two axes: agency versus communion and self versus others. Individuation (self and agency) involves autonomy and self-expression through work. Contribution (others and agency) reflects meaning derived from benefiting others. Self-connection (self and communion) arises from alignment of work with personal identity and values. Lastly, unification (others and communion) emphasizes a sense of belonging to something larger. These pathways represent distinct yet interconnected means through which individuals experience work as meaningful.

In motivational theory, classical authors emphasize the role of meaning in human motivation. Maslow (1970) places self-actualization - linked to purpose and meaning - at the top of his hierarchy. Alderfer´s (1969) ERG theory refines Maslow's model into three needs (existence, relatedness, and growth) and suggests that multiple needs can influence motivation simultaneously. Herzberg´s et. al., (1959) two-factor theory emphasizes intrinsic factors such as achievement and growth as key to job satisfaction and meaningful work, while hygiene factors prevent dissatisfaction. McGregor's (1960) Theory X and Theory Y propose those managerial assumptions shape work attitudes: Theory X sees employees as lazy and in need of supervision, whereas Theory Y sees them as self-motivated and seeking meaningful work. Theory Y is consistent with the idea that meaningful work increases motivation and productivity.

The job characteristics model proposed by Hackman and Oldman (1975) emphasizes the significance of meaningfulness in fostering job satisfaction and intrinsic motivation, which in turn enhance performance and satisfaction. In the absence of meaningful work, employees may experience feelings of discontent, frustration and exhaustion, which can ultimately lead to a reduction in productivity. Wong (1998) and Michaelson (2019) additionally posit that meaningful work fosters growth and self-realization, which serve to maintain employee motivation. Similarly, Ryan and Deci's (2000) Self-Determination Theory (SDT) posit that fulfilling psychological needs – autonomy, competence, and relatedness – are crucial for meaningful work, leading to enhanced engagement and well-being. By supporting these needs, organizations can foster a motivated and resilient workforce.

Furthermore, Bailey et al. (2016) stated that organizations that create environments that foster meaningful work not only see improved employee retention but also improved organizational performance. Employees who find meaning in their work are more engaged, more loyal and more likely to take initiative. In addition, the theme of self-transcendence - the need to transform oneself and the world around one - is central to the concept of meaningful work (Fairlie, 2010). When employees are given the opportunity to engage in work that

contributes to something greater than themselves, they experience a deep sense of satisfaction and fulfilment. This, in turn, fosters a deeper connection to their work and a willingness to invest more of themselves in their roles.

Organizational studies, particularly as demonstrated by the concept of job crafting Wrzesniewski et al. (2001), highlight how employees can enhance their personal meaning by reshaping their roles through adjustments to tasks, relationships and perspectives. This transition from a traditional, hierarchical model to a more flexible one, aligns with autonomy that is increasingly valued in today's work settings, including those of digital knowmads. While job crafting enhances meaning by redesigning work content, digital nomadism offers an alternative approach: changing the work context itself. Digital knowmads find meaning through diverse locations, blending work with exploration and self-direction, which presents a unique path to fulfilment.

1.2 The rise of digital nomadism

The rapid growth of digital nomadism is closely tied to socio-political and technological advancements, including the processes of globalization, increased mobility, the advent of wireless communication, and the evolution of flexible work arrangements (Makimoto, 2013). These shifts have resulted in the emergence of novel social patterns and opportunities, characterized by the integration of work, travel and leisure into a mobile lifestyle (Müller, 2016; Orel, 2019).

The phenomenon of digital nomadism is receiving increasing attention in business and professional publications. However, academic research on this growing trend is a relatively recent development (Reichenberger, 2018). The phenomenon of digital nomadism has emerged as a response to the evolving nature of work and the search for meaningful professional experiences. The concept of the knowmad introduced by Moravec (2013a), characterizes a type of knowledge worker who can thrive in flexible and dynamic work environments. As defined by Moravec (2013b), a knowmad is a nomadic knowledge and innovation worker who is creative and imaginative, able to work with almost anyone, at any time, and in any location. Müller (2016) posits that digital nomads represent a new generation of freelancers, entrepreneurs, and online self-employed individuals who are location-independent and have the freedom to decide when and where to work.

As observed by Wang et al. (2019), digital nomadism represents not only a novel lifestyle but also a transformative approach to the organization and fulfilment of work tasks. As Thompson (2019) observes, digital nomadism provides the opportunity to work remotely while

travelling the world, with travel forming an integral aspect of this lifestyle. The "urge to travel" and the capacity to work remotely constitute the fundamental elements of digital nomadism (Makimoto, 2013). The study of this phenomenon is an expanding field of research, with investigations examining its implications for work, mobility, and lifestyle in diverse geographical contexts.

The phenomenon of digital nomadism represents a contemporary solution to the challenge of identifying meaningful work. In contrast to modifying tasks or relationships within a fixed environment, digital nomads chose the context of their work by leveraging the flexibility to decide where, when, and how they perform their jobs. This distinctive approach is in accordance with the transition towards remote and hybrid working, which numerous organizations have indicated will be a long-term phenomenon (Müller, 2016). Embracing this fluid work structure demonstrates that digital nomads can foster a deeper sense of purpose and fulfilment by changing the work context, rather than merely adjusting the content of work.

It is challenging to provide precise statistical data on the global population of knowmads due to the diverse and fluid nature of this lifestyle and the lack of a universally accepted definition thereof. As of 2019, the global population of digital nomads is estimated to be 40 million individuals, with the United States accounting for approximately 18.1 million of them (*State of Independence in America*, 2019). Since 2018, the phenomenon of digital nomadism has been recognized as a discrete category in the State of Independence in America report, which provides one of the initial statistical estimates of this trend. The report defines digital nomadism as a location-independent, technology-enabled lifestyle that combines work and travel (*State of Independence in America*, 2018). This phenomenon encompasses individuals who may be long-term travelers, or those taking temporary working trips or extended working periods away from their place of employment.

The relevance of digital nomadism to Human Resource Management (HRM) and organizational management lies in its challenge to traditional work models. knowmads value autonomy and purpose and tend to reject conventional hierarchical structures, creating their own professional ecosystems rather than adhering to predefined roles within organizations (Audrin et al., 2024). The growth of digital nomadism goes together with the transition towards remote and hybrid work arrangements, which require a revision of how HRM can understand emerging competencies and provide service to this workforce. Digital knowmads lifestyle are characterized by a commitment to flexibility, autonomy and technology-enabled productivity. This aligns with the challenges posed by remote and hybrid work arrangements (Tramontano et al., 2021). The context of digital knowmads has no constraints of a fixed office but it does

have new constraints related to the weakened direct personal contact and so HRM must design innovative strategies that ensure connectivity, belonging, and productivity to foster sustainable, healthy, and engaging work environments (Cook, 2020).

The challenges faced by digital knowmads, such as the "always on" culture and the lack of physical boundaries, underscore the necessity of developing competencies in resilience, self-management, and digital literacy (Tramontano et al., 2021). By equipping employees with these skills, HR professionals can support not only digital knowmads but also remote workers in general, thereby ensuring their ability to flourish in these flexible and fluid work arrangements while maintaining a sense of purpose and connection to the organization. This dual focus helps organizations retain top talent and embrace the benefits of location-independent work while mitigating its potential risks (Fairlie, 2010).

1.3 Competencies for digital nomadism

The foundation for competencies theory can be found in motivational theory where the main authors propose dimensions that directly connect to competence and competencies. Namely, McLelland's (1985) model proposed three fundamental needs: achievement, affiliation, and power. The need for achievement concerns the pressure to act in a way that allows one to feel they have attained certain goals in life or at work. People with a high level of this need tend to prefer tasks with clear objectives and explicit feedback and opportunities to demonstrate their competence. The need for affiliation emphasizes the importance of developing and maintaining strong interpersonal connections and participating in collaborative tasks. This contributes to positive perceptions of leadership. Lastly, the need for power involves seeking influence, prestige and control. People with a high need for power often thrive in competitive, status-oriented situations and take on significant organizational responsibilities.

This established the grounds for a more recent and comprehensive theory, self-determination theory by Ryan and Deci (2000) which departs precisely from the same fundamental needs (competence, autonomy, and belongingness) as requirements to experience high quality motivation, i.e. intrinsic motivation. Competencies are not directly targeted by these theories, but they lay ground to highlight this dimension as critical in understanding and managing workplaces.

Making competencies explicit, Spencer's iceberg model (Spencer & Spencer, 1993) highlights the layered nature of competencies. Like the tip of a visible iceberg, the model illustrates that only a small portion of an individual's competencies (knowledge and skills) are

easily observable. These visible competencies are generally easier to assess and develop through education and training. Beneath the surface lie hidden layers such as self-concept, traits and motives. These deeper elements are less accessible and more resistant to change. Motive drives consistent behavior towards specific goals. Traits reflect habitual patterns of response and are shaped by both physical and psychological characteristics. Self-concept includes an individual's values, identity and self-image and can be changed gradually through sustained developmental efforts.

More recently, Roe's architectonic model (Roe, 2002) built upon earlier contributions by recognizing a hierarchical structure in the development of competencies. This model suggests that foundational characteristics, such as personality traits and abilities, form the basis upon which knowledge, skills, and attitudes are developed through education and practice. Roe conceptualized competence as the ability to perform a task, duty or role adequately within a specific work context through learning. In comparison with isolated constructs such as knowledge, skills or attitudes, which can be developed and assessed independently, competence represents the integration of these elements and is primarily acquired through practical, work-related experience, whether real or simulated. The model also distinguishes between competencies and sub-competencies. Competencies refer to complex, role-specific capability, such as conducting psychological assessments or drafting legal contracts, while sub competences reflect more generic capabilities, such conducting interviews or leading a team.

Competencies can be defined as a combination of knowledge, skills, and attitudes that enable individuals to perform tasks effectively and adapt to various work environments (Gonzalez Vazquez et al., 2019). As observed by Grant and Clarke (2020), the technological revolution has not only redefined the nature of work but also demands the development of new skills. The researchers highlight that the impact of new technologies is primarily manifested in the modification of tasks, rather than the complete elimination of jobs (Chevtaeva & Denizci-Guillet, 2021). They stress the idea that the impact of digital technologies on the labor market is not limited to the creation and elimination of jobs, they also have the potential to transform the way in which individuals perform their work.

Dealing with these changes means that individuals must develop both digital skills and non-cognitive skills (Gonzalez Vazquez et al., 2019). Digital skills are obviously required to be able to effectively use technology, but they are not sufficient to ensure job performance or wellbeing because work entails interpersonal relationships and the need to belong just as stated in SDT (Ryan & Deci, 2000). These are the non-cognitive skills, which include emotional and social regulation, adaptability, and resilience among others (Peretz et al., 2018). Although

digital skills were the main concern at early research, non-cognitive skills are gaining momentum as there is a widespread acceptance that they can hardly be replaced by technology (Gonzalez Vazquez et al., 2019; World Economic Forum, 2018). Consequently, these non-cognitive skills are required to balance the demands of remote work with personal well-being. Organizations that want to employ digital knowmads and provide sustainable and healthy, productive work experience must consider a set of work competencies in line with the nature of remote work arrangement (Grant & Clarke, 2020).

To further substantiate the relevance of the research topic, a comparative analysis of competencies was conducted based on three key papers by Tramontano et al. (2021), Bratianu et al. (2021), and Schulze & Krumm (2017). A comparison table was created to identify commonalities and differences across the frameworks. Notably, some similarities emerged, particularly in the competencies of self-management and advanced ICT skills, which appeared consistently across all models. Moreover, a recent study by Audrin et al. (2024) presents an alternative framework for digital competencies. This framework introduces cybersecurity as a new and critical competency, which is essential and should be incorporated into the final model (Table 2.1).

The section delineates the essential competencies hypothesized to be positively associated with the meaningful work among digital knowmads. The central hypothesis (H1) posits that digital competencies collectively enhance knowmads' sense of meaningful work engagement. This primary hypothesis is further refined through several specific sub-hypotheses, each examining distinct competencies that contribute to meaningful work in a nomadic context.

Digital competencies are positively associated to knowmads meaningful work:

H1a: Self-management skills are positively associated to knowmads meaningful work.

H1b: ICT skills positively associated to knowmads meaningful work.

H1c: Trust building skills positively associated to knowmads meaningful work.

H1d: Intercultural skills positively associated to knowmads meaningful work.

H1e: Social skills positively associated to knowmads meaningful work.

H1f: Emotional skills positively associated to knowmads meaningful work.

H1g: Cybersecurity skills positively associated to knowmads meaningful work.

These hypotheses aim to investigate the relationship between each of these competencies and the meaningful work for digital knowmads.

Table 2.1 Knowmad competencies framework comparison

Dimension	Bratianu et al. (2021)	Schulze & Krumm (2017)	Tramontano et al. (2021)	Source
Self-management skills	Self-management: complex competence that integrates domain-specific knowledge, resource management, critical thinking, decision-making skills, and entrepreneurial attitudes.	Self-management: the skill to manage oneself effectively (e.g., self-, time-, and project-management).	Self-care: The ability to successfully manage the boundaries between work and life provided by digital technology.	A, B, C
Trust-building Skills	-	Trust-related KSAOs: skills to develop and maintain interpersonal trust (e.g., responsiveness, dependability, active and frequent participation); disposition to trust.	Trust-Building Skills: The capability to build trustworthy relationships with leaders and colleagues, minimizing the need for supervision.	B, C
Advanced ICT Skills	knowmads require advanced ICT skills, including e-awareness, digital, media, and technological literacy, to thrive in a fast-evolving digital landscape.	Media KSAOs involve understanding the functionality of a medium, staying updated on its features, and adapting to channel limitations effectively.	E-Skills: the ability to utilize ICTs in managing workloads and work tasks. Proficiency in using project management software and digital communication tools.	A, B, C
Social Skills	-	-	Remote Social Skills: The ability to build and maintain social relationships remotely.	C
Emotional skills	Emotional and Spiritual Intelligence. Managing one's own emotions and spiritual well-being and recognizing these in others.	-	Remote Emotional Skills: the ability to manage and control emotions when working remotely.	A, C
Intercultural Skills	Cultural Intelligence: the ability to effectively manage in diverse cultural settings.	Intercultural KSAOs: Knowledge and skills that help to interact with people from different cultures.	-	A, B
Cybersecurity Skills	-	-	Skills to protect devices, personal data, and institutional information.	Audrin (2024)

a) Bratrianu et al. (2021), b) Schulze & Krumm (2017) c) Tramontano et al. (2021)

1.4 Critical competencies for knowmads

One interesting issue that emerges in literature, namely in Bratianu et al. (2021) article, concerns the relative importance of digital knowmad competencies. These authors state that self-management is critical for digital knowmads as the level of autonomy they enjoy also require from them an absolute capacity to manage their own activity, time, and competing demands. This goes in line with SDT (Ryan & Deci, 2000) that gives autonomy a central role as a primary motivational need. Likewise, as reviewed, JCR model (Hackman & Oldham, 1976) also conceives autonomy at work as a critical requirement for high motivation.

These theories highlight autonomy within the assumption of a controlled in-person work environment and thus, they may miss the idea that under the new social contract that the digital transformation brings, autonomy also lowers the sense of direction and structure that the traditional social contract offered (Hackman & Oldman, 1976). This may stress some individuals due to a loss of sense of direction and structure. In some cases, autonomy without due capacity to self-manage (e.g. time) or as a feature of larger job duties that lead to higher productivity pressure, can lead to negative effects (Kubicek et al., 2017) such as procrastination. Likewise, Bratianu et al. (2021) highlighted the critical role of intercultural skills which is logical when one considers the fact that most digital knowmads are individuals that have moved out of their own country.

In line with SDT (Ryan & Deci, 2000) the need for relatedness and feeling one belongs to a community should require individuals to overcome cultural and language barriers to satisfy this primary need. Therefore, intercultural skills, or cultural intelligence, constitutes an additional pivotal competency for knowmad paradigm. Cultural intelligence is the capability to function effectively in culturally diverse settings, involving a combination of knowledge, skills and attitudes that support cross-cultural interactions (D'Andrea, 2006). This skill is of value to knowmads, who frequently operate across a multitude of cultural boundaries. As emphasized by Bratianu et al. (2021), cultural intelligence encompasses a range of abilities that facilitate effective communication and collaboration across cultures, thus enabling knowmads to adapt effectively and engage in global work contexts.

Considering Bratianu et al.'s (2021) proposal that self-management and intercultural skills are critical competencies for knowmads, the following hypotheses are put forth for consideration:

H2: The association between self-management skills and knowmads meaningful work is stronger than that of other competencies, except for intercultural skills.

H3: The association between intercultural skills and knowmads meaningful work is stronger than that of other competencies, except for self-management skills.

1.5 Conceptual model

The hypotheses suggest a conceptual model divided in two graphical presentations, one concerns the set of competencies that, according to literature and theory, operate as predictors of a meaningful work, which is depicted as list of variables linked via arrows (that represent the first sub hypotheses). The other concerns the relative importance of such competencies and are depicted as a differential thickness of two of the arrows, self-management skills (H2) and intercultural skills (H3) respectively.

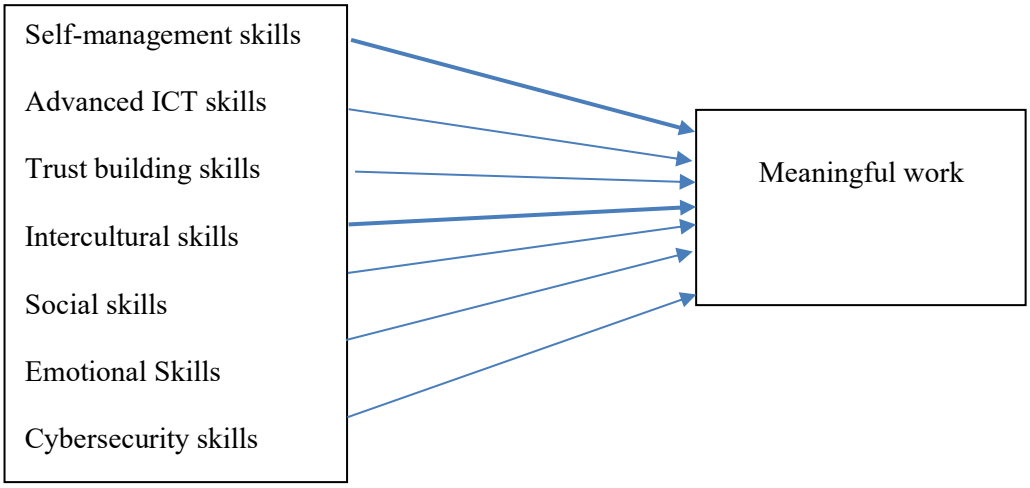

Figure 2.1 Conceptual model

CHAPTER 2

Method

This chapter will start by detailing the procedure for contacts and data collection, followed by the data analysis strategy comprising both the psychometric quality testing and data analyses intended to test the hypotheses, followed by sample characteristics and measures used.

2.1 Procedure

The research process was conducted in accordance with a systematic approach to identifying, contacting, and collecting data from digital knowmads across the globe. The selected methodology would be a quantitative survey. The target population consisted of individuals engaged in location-independent work, integrating travel with their professional responsibilities (Moravec, 2013b). Participants were reached through professional and social networking platforms widely utilized by digital knowmads, including LinkedIn, a platform that facilitated targeted searches and connections with professional digital knowmad groups, and Telegram Groups, communities specifically created for digital knowmads to network and share experiences.

To guarantee the relevance of the participants to the research objectives, an exclusion criterion was incorporated into the survey. The participants were presented with the following question: A digital knowmad is someone who uses technology to work remotely and live a location-independent lifestyle, often travelling and living in different places while maintaining their career or business online. Do you currently match this description? Participants who answered "No" were redirected to the end of the survey, excluding them from further participation. This ensured that only those fitting the digital knowmad definition participated in the study.

To capture the distinctive characteristics of digital knowmads, the survey employed a non-probabilistic sampling approach, combining purposive sampling (criterion included being a digital knowmad with an active location-independent lifestyle, working remotely across different locations) and snowball sampling (initial participants were asked to refer other digital knowmads within their networks). This dual approach permitted the targeting of participants while enabling them to suggest others within their networks, thus broadening the scope of the study. The principal focus of the study was digital knowmads, with a notable proportion of the sampled population originating from Portugal. However, the sample also included participants

from various countries, thereby reflecting the global nature of digital nomadism. The diverse representation was designed to facilitate the capture of insights that are applicable to remote workers across the globe. The structured procedure, exclusion criterion, and quantitative analysis methodology collectively reinforce the reliability and validity of the findings.

2.2 Data analysis strategy

Data analysis included an assessment of the psychometric properties of both the competency and meaningful work scales. A psychometrically sound measure must comply with validity and reliability requirements. Validity refers to the fact that a given measure is measuring what it is intended to, i.e. it must have construct validity, convergent validity, and discriminant validity. Construct validity is gauged by means of factor analysis. In the case of pre-existing measures, a confirmatory factor analysis is conducted to test the fit of the theoretical model to the data structure.

A good fit is given by indices which Hair et al. (2019) recommends as follows: non-significant chi-square, a normed chi-square below 3, a CFI and TLI at least of 0.95, a RMSEA below .07, and a SRMR below .08. These cut-offs are subjected to adjustment considering both the number of estimated parameters and the sample size. Convergent validity is measured with Fornell and Larcker (1981) Average Extracted Variance (AVE) which should attain .50 for the items to be considered sufficiently related to the latent variable. Lastly, discriminant validity is measured with Henseler et al. (2015) HTMT, which should not overpass .85 between all possible pairs of latent variables. Additionally, a measure must be reliable, i.e. it must at least have internal consistency, which is operationalized by Cronbach alpha which is expected to reach .70 to show acceptable reliability.

Hypotheses were tested using multiple linear regression analysis (MLRA) to evaluate how the competencies influenced meaningful work, namely hierarchical regression analysis that allows for the sequential input of variables so that subsequent variables are tested controlling for those that have already been inputted in previous steps. Regression coefficients for each competency were calculated, and a bootstrapping procedure with 5,000 repetitions was applied to ensure robust and reliable confidence intervals at the 95% level. This approach provided insights into the connection between dynamic digital knowmad competencies and their ability to derive meaning and fulfillment from their work. Lastly, because the second and third hypotheses entail a slope comparison, Z-tests were used to ascertain the size of each regression coefficient with the intention of ascertaining whether Self-management or Intercultural skills

were more effective predictors of meaningful work than the remaining competencies as posited by Bratianu et al. (2021).

2.3 Sample

The sample comprises 253 individuals average 34.4 (sd=8.6) ranging from 19 to 62 years-old, gender balanced (51% female), with an average tenure as digital knowmads of 4.8 years (sd = 5.7) and working in diverse industries namely Automotive; Administrative_Services; Creative_Arts; Banking; Business; Construction; Design; Economy; Education; Energy; Finance; Health; HR; IT; Legal Services; Logistics; Manufacture; Marketing; Media; Photo; Psychology; Public Service; Research; Sales; Tech; Telecom; Tourism. The prevailing industry in the sample is IT (31.2%). The sample has a diverse range of educational levels with most individuals holding a master's degree (42.7%) closely followed by bachelor's degree (39.9%). To the exception of doctorate participants (2%) all the remaining do not hold a higher education degree (although 7% reports having had some college or university attendance but without a degree). Therefore, the sample is highly educated.

2.4 Measures

All measures were evaluated using a 5-point Likert scale, with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) except otherwise noted.

Digital knowmad Skills were measured mostly from Tramontano et al. (2021) but also from Ang et al. (2007) and Audrin et al. (2024) as detailed. Self-Management Skills were assessed with Tramontano et al. (2021) scale comprising three items: 1) "Manage your time effectively, even if you have to juggle personal and professional commitments," 2) "Organize your activities, despite any distractions in your surroundings," and 3) "Plan your activities effectively, despite disruptions you might face.". Trust-Building Skills were assessed with Tramontano et al. (2021) scale comprising three items: 1) "Complete your tasks, even with minimal supervision," 2) "Self-manage your time to ensure you complete tasks on time and to a high standard," and 3) "Constantly abide by organizational rules and policies, even when a shortcut could help you complete your tasks more quickly.". Advanced ICT Skills were assessed with Tramontano et al. (2021) scale comprising three items: 1) "Understand when technology usage is impacting your well-being, even if you are very focused on some work tasks" 2) "Take actions if you realize that being 'always on' is becoming too much," and 3) "Use different coping strategies to deal effectively with periods of high workload.". Social Skills

were assessed with Tramontano et al. (2021) scale comprising three items: 1) "Use a range of different digital communication tools to quickly build rapport with others," 2) "Utilize a range of social networking tools to maximize your work relationships," and 3) "Build networks (including virtually) with diverse groups of people.". Emotional Skills were assessed with Tramontano et al. (2021) scale comprising three items: 1) "Avoid feeling anxious if you receive work notifications outside working hours," 2) "Manage your working hours as you prefer, without feeling guilty for not being online when your colleagues are," and 3) "Not worry that your colleagues will doubt you are actually working.". Intercultural Skills were derived from the motivational dimension of Ang´s et al. (2007) Cultural Intelligence Scale, using three items: 1) "I enjoy interacting with people from different cultures," 2) "I am confident that I can socialize with locals in a culture that is unfamiliar to me," and 3) "I am sure I can deal with the stresses of adjusting to a culture that is new to me.". Cybersecurity Skills were evaluated with three items from Audrin et al. (2024) as follows: 1) "Identify the most adequate protection and security measures for various devices," 2) "Apply various ways to protect your personal data and private life online," and 3) "Apply the adequate processes to protect institutional data."

Meaningful work was measured with Steger et al. (2012) Work as Meaning Inventory (WAMI), which comprises 10 items organized in three factors: Positive Meaning (4 items, "1. I have found a meaningful career.", "4. I understand how my work contributes to my life's meaning.", "5. I have a good sense of what makes my job meaningful.", and "8. I have discovered work that has a satisfying purpose."), Meaning Making Through Work (3 items, "2. I view my work as contributing to my personal growth." "7. My work helps me better understand myself.", "9. My work helps me make sense of the world around me.", and Greater Good Motivations (3 items, "3. My work really makes no difference to the world." (reverse-coded), "6. I know my work makes a positive difference in the world.", and "10. The work I do serves a greater purpose.").

Control variables comprehended gender (1=Feminine; 2=Masculine; 3=Other), age (measured as integer natural number), tenure as a digital knowmad (measured as integer natural number), education (1=No formal education; 2=Primary/Elementary school; 3=Secondary/High school; 4=Vocational/Technical training; 5=Some college or university but no degree; 6=Bachelor's degree; 7=Master's degree; 8=PhD). Industry was measured as an open field and later re-coded according to the International Standard Industrial Classification (ISIC, Revision 4) from UN (2008).

As regards **Validity and reliability** of Digital knowmad Skills, a CFA of the seven factors showed acceptable fit indices ($X^2(168) = 255.193$, $p<.001$; $X^2/df=1.519$; CFI=.947; TLI=.933; RMSEA=.045 90% CI [.034;.056]; PClose=.755; SRMR=.0608) but some factors have insufficient convergent validity as evidenced by AVE.

A PCA showed a valid solution as indicated by KMO and Bartlett's statistic, but one item has insufficient commonality (ICT9 I use different coping strategies to deal effectively with periods of high workload) and another item loaded in the wrong component (SS10. I use a range of different digital communication tools to quickly build rapport with others). After removing these items, a valid factor solution was found (KMO=.811; Bartlett's $X^2(171) =1601.321$; $p=.000$) accounting for 70.4% of variance after rotation (ProMax).

By analyzing the factor loadings, it was evident that all items loaded more in the component they were expected to. However, components had insufficient reliability as indicated by Cronbach alpha. By consulting the Cronbach alpha if some items were deleted, we opted to remove the offending items. Therefore, from the original items, all the items from ICT were removed, together with one item from emotional skills (ES13. I avoid feeling anxious if I receive work notification outside the working hours) and another one from team building skills (TBS6. I constantly abide by organizational rules and policies, even when a shortcut could help me to complete my tasks more quickly). A new PCA showed a six final component solution that is valid (KMO=.781; Bartlett's $X^2(105) =1326.998$; $p=.000$) and accounts for 75.2% variance after rotation (ProMax). The solution has no reliability or convergent validity issues. The structure matrix is shown in Table 3.1 together with reliability and convergent validity indicators (only for those items highlighted in bold).

Table 3.1 Structure matrix for Digital knowmad Skills

	1	2	3	4	5	6
SM3. I plan my activities effectively; despite disruptions I might have.	**0.872**	0.268	0.318	0.219	0.420	0.252
SM2. I organize my activities, despite any distractions in my surroundings.	**0.871**	0.190	0.228	0.251	0.431	0.171
SM1. I manage my time effectively, even if I must juggle personal and professional commitments.	**0.838**	0.200	0.298	0.114	0.398	0.159
CSS20. I apply various ways to protect my personal data and private life online.	0.230	**0.889**	0.229	0.168	0.250	0.199
CSS21. I apply the adequate processes to protect institutional data.	0.207	**0.851**	0.298	0.036	0.328	0.167
CSS19. I identify the most adequate protection and security measures for various devices.	0.217	**0.830**	0.236	0.233	0.172	0.190
ICS17. I am confident that I can socialize with locals in a culture that is unfamiliar to me.	0.300	0.259	**0.883**	0.217	0.222	0.310
ICS16. I enjoy interacting with people from different cultures.	0.219	0.225	**0.799**	0.100	0.180	0.286
ICS18. I am sure I can deal with the stresses of adjusting to a culture that is new to me.	0.301	0.244	**0.777**	0.366	0.165	0.183
ES15. I don`t worry that my colleagues will doubt I am working.	0.203	0.195	0.203	**0.864**	0.216	0.031
ES14. I manage my working hours as I prefer, without feeling guilty for not being online when my other colleagues are.	0.207	0.121	0.260	**0.856**	0.210	0.142
TBS4. I complete my tasks, even with minimal supervision.	0.434	0.222	0.204	0.247	**0.899**	0.142
TBS5. I self-manage my time ensuring to complete tasks on time and to a high standard.	0.471	0.329	0.247	0.212	**0.891**	0.081
SS11. I utilize a range of social networking tools to maximize my work relationships.	0.139	0.135	0.229	0.067	0.131	**0.897**
SS12. I build networks (including virtually) with diverse groups of people.	0.291	0.280	0.366	0.114	0.071	**0.864**
AVE	0.740	0.734	0.673	0.739	0.801	0.775
Cronbach's alpha / r_{SB}	0.827	0.820	0.760	0.678	0.769	0.719

By submitting this solution to a CFA, a very good fit was found ($X^2(78)=80.103$, $p<.001$; $X^2/df=1.027$; CFI=.998; TLI=.998; RMSEA=.010 90%CI [.000;.037]; PClose=.998; SRMR=.0348) with loadings that also match the reliability and convergent validity findings previously reported as shown in Figure 3.1.

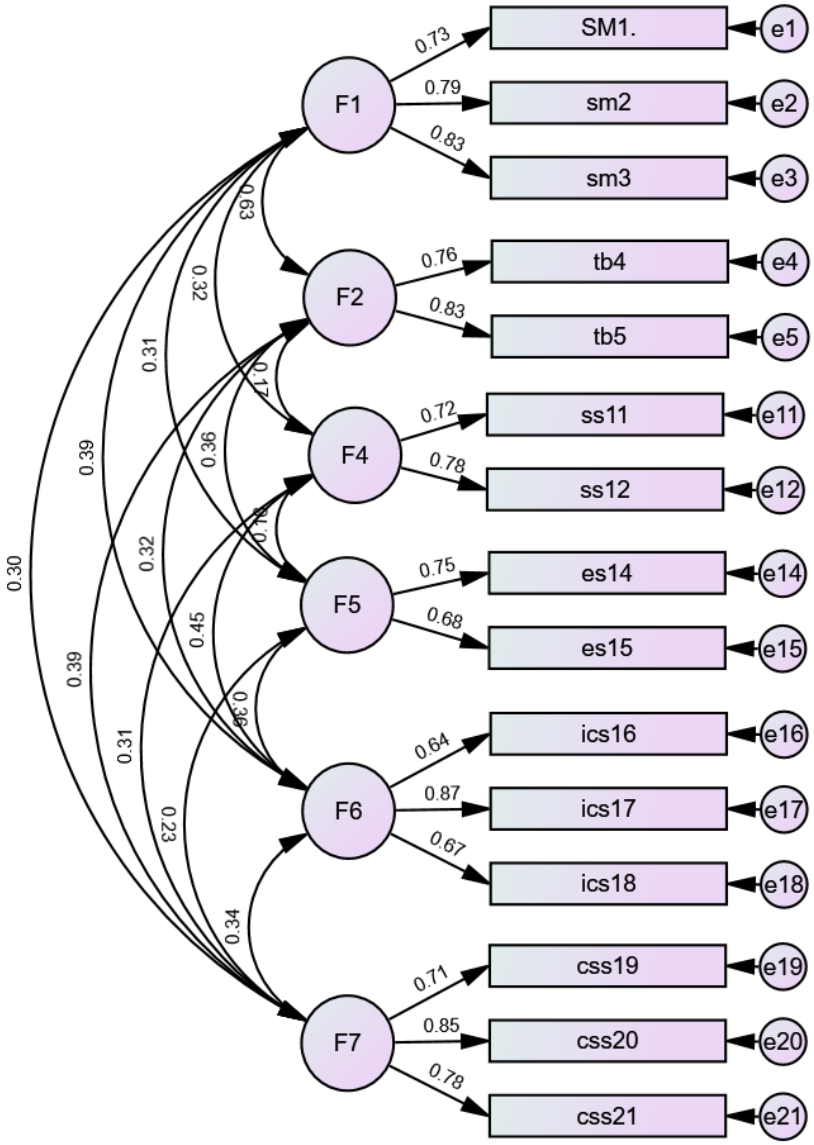

Figure 3.1 CFA for Digital knowmad Skills (revised)

This solution has also good discriminant validity as no occurrence of a HTMT value between any paired-latent factors was found to reach .85 as calculated from the correlation table between all items that as comprised in the respective latent constructs (Table 3.2 below).

Table 3.2 HTMT for Digital knowmad Skills

	Heterotrait	Monotrait1	Monotrait2	HTMT
SM-TBS	0.394	0.615	0.625	0.636
SM-SS	0.181	0.615	0.561	0.307
SM-ES	0.171	0.615	0.512	0.305
SM-ICS	0.231	0.615	0.512	0.412
SM-CSS	0.185	0.615	0.604	0.303
TBS-SS	0.105	0.625	0.561	0.178
TBS-ES	0.210	0.625	0.512	0.372
TBS-ICS	0.185	0.625	0.512	0.327
TBS-CSS	0.236	0.625	0.604	0.385
SS-ES	0.082	0.561	0.512	0.152
SS-ICS	0.241	0.561	0.512	0.450
SS-CSS	0.175	0.561	0.604	0.301
ES-ICS	0.201	0.512	0.512	0.392
ES-CSS	0.135	0.512	0.604	0.243
ICS-CSS	0.205	0.512	0.604	0.370

As regards **meaningful work scale**, the CFA showed poor fit ($X^2(32) = 123.809$, $p<.001$; $X^2/df=3.869$; CFI=.935; TLI=.909; RMSEA=.107 90% CI [.087;.127]; PClose=.000; SRMR=.0462) also with indication of strong covariance between latent constructs, which suggest a different factor structure.

A PCA showed a valid factor solution (KMO=.909; Bartlett's x2(45) = 1442.030; p=.000) with one item showing too low commonality (the one that was reversed, "3. My work really makes no difference to the world") and a new factor analysis without this item still has stronger indicators (KMO=.913; Bartlett's x2(36) = 1352; p=.000) and only extracts a single factor accounting for 60.7% total variance.

A CFA of this single-factor solution has still issues pertaining to some fit indices ($X^2(32) = 123.809$, $p<.001$; $X^2/df=3.869$; CFI=.935; TLI=.909; RMSEA=.107 90% CI [.087;.127]; PClose=.000; SRMR=.0664). From observe Lagrange multipliers, one could infer that error covariances would be needed between some items with two others ("7. My work helps me better understand myself", "10. The work I do serves a greater purpose") to better match the data structure. Therefore, by removing these items a new CFA solution was found with acceptable fit indices ($X^2(14) =34.456$, $p<.001$; $X^2/df=2.461$; CFI=.978; TLI=.967; RMSEA=.076 90% CI [.044;.109]; PClose=.083; SRMR=.0664). Figure 3.2 shows the CFA solution.

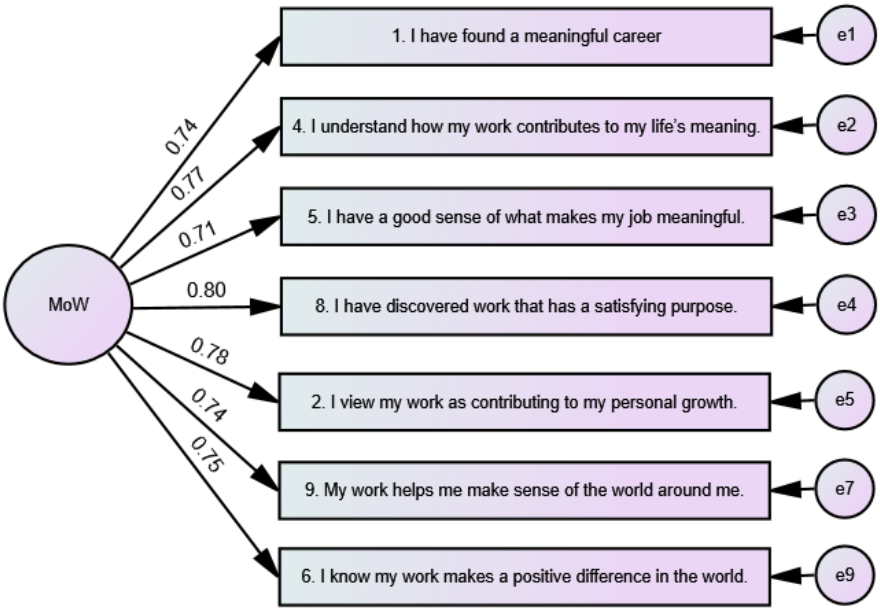

Figure 3.2 CFA for Meaningful work

This single-factor solution has good reliability (Cronbach alpha=.902) as well as convergent validity (AVE=.571).

2.5 Common method variance

Because all data was collected simultaneously and both independent and dependent variables were reported by the same source and have a subjective nature, there is a strong likelihood that answers suffer from what has been known as common method variance (Podsakoff et al., 2003). This bias occurs because individuals will keep in their memory previous answers and due to psychological pressure for consistency, they will endeavor to align their answers in a way that preserves their sense of coherence. Ultimately this means that not only the model will account for inflated variance compared to reality as even the effects themselves might emerge as significant while they may be absent at all.

To test this possible bias, we have deployed Harman test which consists of an exploratory factor analysis with all items from all constructs together and if the matrix before rotation shows a single factor that comprises all items, or if the first factor accounts for more than half the variance accounted by all factors and included items from different constructs (namely from those treated as predictors and consequences) then we know common method bias in indeed present in the analyses. If, however, this is not found, we can proceed with the analysis as the effects will not be substantially biased due to this process. By applying the Harman test we found a solution that comprises eight factors and accounts for 65.3% of total variance before

rotation, while the first factor only accounts for 26.2%, therefore not reaching the threshold. Most importantly, the first factor only comprises items from competencies and none from meaningful work. Therefore, we conclude that common method bias is not a concern for this study.

CHAPTER 3

Results

This chapter will present the descriptive and bivariate statistics crossing sociodemographic variables and those comprising the conceptual model among each other, and findings concerning hypotheses testing.

3.1 Descriptive and bivariate statistics

Participants report a general level of skills above the scale's midpoint (m=3.82, SD=.53). Considering individually each skill, the highest value is found in Trust Building (m=4.22, SD=0.79) followed by Intercultural Skills (m=4.02, SD=0.78). In the second tier one can find Cybersecurity Skills (m=3.87, SD=0.84) and Self-management skills (m=3.74, SD=0.79). Moving closer to the midpoint, the lowest values are found in emotional skills (m=3.63, SD=0.99) and social skills (m=3.40, SD=1.03). As per meaningful work, participants report on average a moderately high level (m=3.82, SD=0.53).

The bivariate statistics show that sociodemographic variables are scarcely correlated with those variables in the model. The highest correlation occurs between gender and social skills (r=-.223, p<.01) where women report having more social skills. Another correlation of minor magnitude was found between age and trust building skills (r=.213*, p<.05) where older participants tend to report higher values of trust building skills. Lastly, another minor magnitude correlation was found between tenure as a digital knowmad (r=-.127*, p<.05) and emotional skills suggesting participants with longer tenure in this situation report having less emotional skills.

As regards the correlation patterns relevant for the conceptual model, the general indicator of digital knowmad skills does show a significant and positive correlation with meaningful work (r=.440, p<.01) which encourages the hypothesized relationship. Also, all the individual skills have also significant and positive correlations with meaningful work (ranging from r=.199 to r=.309, p<.01) which strengthens this preview of possible findings pertaining the hypothesis.

Table 4.1 Descriptive and bivariate statistics

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Gender (FM)	51%F	-	1										
2. Age	34.43	8.60	.028	1									
3. Education	5.54	1.05	.059	.219**	1								
4. Tenure as Digital knowmad	4.76	5.67	.025	.173**	-.069	1							
5. Self-Management skills	3.74	0.79	-.066	.097	-.004	.068	1						
6. Trust-building skills	4.22	0.79	-.007	.137*	-.039	.042	.506**	1					
7. Social skills	3.40	1.03	-.223**	-.070	.117	-.058	.236**	.133*	1				
8. Emotional skills	3.63	0.99	-.001	-.010	-.011	-.127*	.227**	.269**	.104	1			
9. Intercultural skills	4.02	0.78	-.067	.067	.061	-.053	.327**	.250**	.332**	.280**	1		
10. Cybersecurity skills	3.87	0.84	.110	.084	.020	-.071	.250**	.303**	.231**	.184**	.290**	1	
11. Digital knowmad skills	3.82	0.53	-.078	.071	.044	-.062	.662**	.636**	.586**	.578**	.653**	.599**	1
12. Meaningful Work	3.73	0.81	-.037	.012	.121	.071	.271**	.298**	.309**	.241**	.309**	.199**	.440**

*p<.05; **p<.01 (two tailed Pearson correlation)

3.2 Hypotheses testing

The hypotheses have been tested simultaneously by means of a hierarchical regression analysis intended to explain meaningful work as a dependent variable where the covariates are included in a first block (namely, gender, age, tenure and education) while the digital knowmad skills are all included simultaneously in the second block.

The hierarchical regression analysis showed a Durbin-Watson statistic of 1.801 (which is very close to the 2.0) indicating that the errors are not autocorrelated, i.e. they are randomly distributed, as expected (Ali, 1987). The bivariate quasi absent correlations between sociodemographic and the dependent variable are confirmed as the first block shows a non-significant F statistic change (ΔF (4, 248) =1.530, p=.194) indicating that the control variables accounted only for 0.8% of variance (adjusted R^2). By adding the digital knowmad skills, the model explanatory power increases to 19.8% variance (adjusted R^2) and a significant estimated F change (ΔF (6, 242) =10.763, p<.001). This indicates that the digital knowmad skills do explain meaningful work above that explained by the sociodemographic variables as shown in the ANOVA table (F (10, 242) =7.214, p<.001). The variance explained is not inflated by multicollinearity as shown with the Variance Inflation Factor that never reaches the 5-value threshold (Marcoulides & Raykov, 2019).

As per the hypotheses, self-management skills are not associated with meaningful work (B=0.051, t=0.749, p=.455, 95% CI [-0.086; 0.191]) which rejects H1a. Conversely, trust-building skills are positively associated with meaningful work (B=0.173, t=2.528, p=.012, 95% CI [0.039; 0.316]) which supports H1c. Intercultural skills showed a positive and significant relationship with meaningful work (B=0.140, t=2.165, p=.031, 95% CI [0.013; 0.280]), which supports H1d. Social skills demonstrated a significant and positive relationship with meaningful work (B = 0.197, t=3.083, p=.002, 95% CI [0.056; 0.253]), thereby supporting H1e. Emotional skills were positively related to meaningful work as well (B=0.133, t=2.179, p=.030, 95% CI [0.011; 0.208]), corroborating H1f. Cybersecurity skills are not significantly associated (B=0.033, t=0.520, p=.603, 95% CI [-0.088; 0.151]) thus rejecting H1g. As the subscales for advanced ICT could not be psychometrically validated, H1b cannot be tested.

As per H2 that compares the relative magnitude of the effects from Self-Management against the other predictors, a Z test was conducted by comparing the difference between unstandardized coefficients divided by the square root of the sum of squares. None of the sub-hypothesis was corroborated as shown in Table 4.3, which fully rejects hypothesis 2. The same occurred for hypothesis 3, leading to its full rejection.

Table 4.2 Regression coefficients for Meaningful Work

	Model 1							Model 2							
Variable	B	SE	Beta	t	p	95% CI LB	95% CI UB	B	SE	Beta	t	p	95% CI LB	95% CI UB	
Control variables															
Constant	3.456	.365		9.460	.000	2.736	4.175	.705	.479		1.473	.142	-.238	1.647	
Gender	-.075	.102	-.046	-.736	.462	-.277	.126	.015	.096	.009	.157	.875	-.175	.205	
Age	-.003	.006	-.032	-.482	.630	-.015	.009	-.006	.006	-.060	-.993	.321	-.017	.006	
Tenure	.020	.009	.137	2.115	.035	.001	.038	.017	.009	.118	1.993	.047	.000	.034	
Educ	.066	.049	.087	1.351	.178	-.030	.161	.088	.044	.116	1.982	.049	.001	.175	
Predictors															
SMS3i								.052	.070	.051	.749	.455	-.086	.191	H1a n.s.
TB2i								.177	.070	.173	2.528	.012	.039	.316	H1c sup.
ICS3i								.154	.050	.140	2.165	.031	.013	.280	H1d sup.
SS2i								.109	.050	.197	3.083	.002	.056	.253	H1e sup.
ES2i								.147	.068	.133	2.179	.030	.011	.208	H1f sup.
CSS3i								.032	.061	.033	.520	.603	-.088	.151	H1g n.s.
R^2	.008						R^2	.198							

Dependent variable: Meaningful work, Bootstrapping 5000 repetitions, 95% Confidence Interval

Table 4.3 Association comparison (Bratianu et al., 2021)

	B1	SE1	B2	SE2	Z	p-value	
SM stronger than TB	.052	.070	.177	.070	-.126	0.21	H2a n.s.
SM stronger than SS	.052	.070	.109	.050	-0.66	0.51	H2b n.s.
SM stronger than CS	.052	.070	.032	.061	0.22	0.83	H2c n.s.
ICS stronger than TB	.154	.050	.177	.070	-0.27	0.79	H3a n.s.
ICS stronger than SS	.154	.050	.109	.050	0.64	0.52	H3b n.s.
ICS stronger than CSS	.154	.050	.032	.061	1.55	0.12	H3c n.s.

CHAPTER 4

Discussion and Conclusion

This chapter will discuss findings in the light of theory to substantiate the hypotheses that were supported as well as those that were not and explore its implications for both theory and practice. Finally, it will acknowledge limitations and indicate venues for future research.

4.1 Discussion and Conclusion

The present study was conducted with the objective of examining which competencies enable digital knowmads to experience meaningful work. The present thesis is grounded in the principles of self-determination theory (Ryan & Deci, 2000) and the expanding body of literature on remote work and digital nomadism (Moravec, 2013a; Grant & Clarke, 2020). The thesis proceeded to test a model comprising seven distinct skill sets: Self-management, Advanced ICT, Trust-building, Intercultural, Social, Emotional and Cyber-security were expected to predict the extent to which knowmads perceive their work as meaningful.

Firstly, the means for each competency inform on knowmads' self-evaluation. The competency with the highest mean is Trust Building closely followed by Intercultural Skills. They are most likely acknowledged by themselves as necessary in any circumstance where one is living in a foreign culture and they do correlate positively (albeit modestly) among themselves. However, this trust building pertains to within-work team and not necessarily a general trust-building, e.g. in the local neighborhood. This interpretation is reinforced by the lowest means being observed in social skills. Therefore, the fact that Trust building is the highest and Social skills the lowest is not contradictory. Moreover, it is interesting to highlight that relatively high dispersion of data distribution in Social skills, implying that the sample might not be homogeneous as regards social competencies (some individuals will report being lowly skilled while others will contrast with that).

In the instance of all predictors being entered in conjunction, it was found that Trust-building, Intercultural, Social and Emotional skills exhibited distinctive positive effects on perceptions of meaningful work while self-management and cybersecurity skills were not predictors.

The findings of this study do not fully align with those of Tramontano et al. (2021), who developed a five-facet e-Work Self-Efficacy model positing that meaningful work is contingent on a balanced portfolio of social, emotional and technical competencies, rather than any single

"super-competency". In the case of this study, only the social and emotional competencies were effective in fostering meaningful work.

However, the array of competencies included in the questionnaire was unbalanced in having more social and emotional competencies than technical ones. Because ICT was discontinued due to factorial analysis, and cybersecurity does not predict meaningful work, technical dimension is missing from explanatory model. This does not come as a fragility in this study because findings to align with literature as stated below. In fact, set of digital knowmad competencies closely relates to SDT (Ryan & Deci, 2000) as the three primary motivational needs are connected to at least one of the competencies included in the model. Namely, autonomy related to self-management skills and eventually with emotional skills (in the sense that emotions drive also the focus when deciding what to do), competence is closely related to technical skills within the digital environment, namely, advanced ICT skills and cybersecurity, and relatedness is closely connected to trust building, intercultural and social skills, also emotional skills.

Stapleton et al. (2023) also reported that, for remote engineering teams, virtual team cohesion was the main source of purpose, rather than autonomy. This is in line with the findings of Ryan and Deci (2000), who emphasized the importance of relatedness as a key factor in intrinsic motivation.

The two absent effects deserve special attention. Firstly, self-management skills. Despite the prevalence of self-management as a top-ranked strategy among experts (Bratianu et al., 2021), it did not demonstrate the expected incremental variance. One plausible interpretation of these results is that of a "threshold effect": once knowmads have mastered basic planning and time-blocking, any subsequent gains in meaning are contingent on higher-order relational skills. A secondary possibility is method variance. The items tapped into the concept of "task organization", yet they did not extend to encompass more profound reflective practices (e.g., purpose setting, value alignment). It is recommended that future research should focus on the separation of surface scheduling from reflective self-leadership.

Moreover, Cyber-security skills were also non-significant, and the advanced ICT skills were to be removed for reasons of validity. In accordance with Herzberg's (1959) two-factor theory, these abilities may be regarded as hygiene factors: their absence engenders anxiety, but their presence does not engender meaning.

The Z-tests returned non-significant results for each comparison indicating that self-management was not a stronger predictor than Trust-building, Social skills, Emotional skills, Cyber-security, or Intercultural skills and in a similar manner, so was Intercultural skills not

found to be superior to the other skills. This may clarify in addition to Tramontano et al. (2021) idea that there is no super-competency, that all relevant competencies are equally needed and that neither self-management nor intercultural skills are particularly more required.

Additionally, it is informative that the control variables do not account for any relevant variance in meaningful work. Together, gender, age, and education only accounted for a mere 0.8% of the variance in meaningful-work perceptions, and none of the three variables reached significance in the final regression model. This suggests that, within a technology-mediated labor market devoid of boundaries, one's demographic characteristics are significantly less consequential than one's psychosocial functionality. One exception was a minor gender effect on social skills, with female participants demonstrating higher scores. This finding aligns with research on online community engagement (Rheingold, 2000).

Overall, regarding the research question that guided this study (What are the key competencies in digital knowmads that foster a meaningful work?) one can state that knowmads that developed further trust building skills, intercultural skills, social skills, and emotional skills are the ones that most likely experience meaningful work. It can also be concluded that self-management and cybersecurity skills are not especially contributive to building meaningful work which allows the conclusion that social and emotional dimension are more central in crafting a work experience that allows one to find meaning in such work.

4.2 Implications for theory and practice

Competencies research is mostly a practice-focused field that directly links to profiling individuals' skills that are acknowledged as contributing to performance, mostly, work performance. There are many theories and models that can be related to competencies research such as SDT (Ryan & Deci, 2000) which highlights the need to experience competency as a requirement for high quality motivation in line also with McLelland's (1985) behavioral competencies model that propose the need for achievement (competence), need for power (autonomy) and need for affiliation (belongingness), Spencer's iceberg model (Spencer & Spencer, 1993) which highlights the layered nature of competencies, and Roe's architectonic model which structures the components of competencies. Work meaningfulness is richer in theory with contributions from Hackman and Oldham (1976) job characteristics model, Baumeister's (1991) existential approach and four needs, Pratt and Ashforth (2003) meaningfulness dimensions, or Rosso et al. (2010) pathways to meaningfulness.

Findings from this study converge with Spencer and Spencer (1993) claim that soft skills contribute the highest to making meaning at work. Likewise, being a digital knowmad (as the name itself suggests) implies being knowledgeable professional in a certain domain, and the likelihood of retaining a job if one fails to meet minimum knowledge requirements is very low due to the flexible work arrangements found in this population (Aroles et al., 2021). This means that knowmads should be both high on autonomy (because they need to) and will hardly be low on technical competence (e.g. ICT skills). This may be the reason why self-management skills are not significantly associated with meaningful work due to being a necessary condition imposed by extreme work autonomy. In the same manner ICT skills did not factualize because it is a basic condition to remain working, while cybersecurity, in digital domain, especially when using public networks, will also be a requirement to remain operating at a distance. Therefore, theory on meaningful work within the context of digital nomads, should basically focus on the only set of competencies that are not truly required to work, i.e. the social competencies. This is a novelty for theory as eventually more theory is needed to detail and distinguish between social competencies and how they operate at a finer grain level.

4.3 Limitations

An evident limitation concerns the sample and sampling procedure. As regards the sample, its size is relatively large to accommodate the data analysis requirements but again, it is hardly representative not only because of the size (if it would be generated randomly it would imply a sample error of 6.15% with 95% confidence, which is already above the usual figure) but mostly because it is a convenience sample, i.e. a sample of individuals that does not guarantee neither randomness (therefore it does not guarantee representativeness) nor that there is no bias in its constitution due to the voluntary nature of participation. This is known as self-selection effect. Because participation is voluntary there is always the possibility of a self-selection effect, i.e. a bias in the sample representativeness due to potential participants deciding to answer or not the survey based on their own features. Therefore, we do not know e.g. if knowmads that have a self-representation of moderate skills might not have opted out.

Still concerning the study design, it is worth mentioning that the data was collected from the same source and at the same time. This can raise concern about endogeneity and the possible existence of common method variance. Still the Harman test does not indicate this is a matter that causes concern.

As regards the conceptual model, eventually the set of skills do not truly operate in isolation each and they may rather operate in configuration. This could suggest that several different skills profiles can lead to the same level of work meaningfulness and that there is not a single profile that one can state as being the best. Likewise, the survey did not control for specific context or the exact nature of the predominant tasks and responsibilities knowmads assume. In certain cases, e.g. a low-level coder, the job itself may require less ICT skills than others that are focused on providing cybersecurity analysis.

4.4 Future research

It would be beneficial to initiate future studies that identify whether such skills can be assumed to translate into long-term career advantages. Future research may benefit from exploring the impact of the competencies identified in this study, with reference to trust-building, intercultural, social and emotional skills. These skills are plausibly relevant to the career sustainability, professional growth and long-term job satisfaction of digital knowmads especially in contrast with the technical competencies that may be subjected to obsolescence due to technological advances. The utilization of longitudinal research designs would prove particularly beneficial, as they facilitate the monitoring of these competencies over time and help in clarifying their influence on career trajectories and adaptability in response to evolving digital work contexts.

Furthermore, the potential for future studies to address the relationship between digital knowmads' competencies and specific industry demands is evident. Such studies could assess the relative importance of competencies in various sectors and roles. Further exploration of competencies not significantly associated with meaningful work, such as self-management and cybersecurity, could provide insights into their roles as potential hygiene factors in line with Herzberg’s typology. Such an analysis would offer insight into how competencies may shift from hygiene to motivational factors depending on what conditions or contexts the individuals are embedded.

Finally, qualitative research may add much knowledge. The purpose of this would be to provide greater insight into how digital knowmads perceive the development and application of their competencies in their daily practice. This would complement quantitative findings and offer richer, contextualized narratives. The result of this would be a richer understanding and more practical implications. Likewise, meaningful work is not the same as a meaningful life albeit they may relate to each other (Baburaj & Marathe, 2023). Therefore, research on

knowmads meaningful work is inviting complementary studies on how they build a meaningful life under their living circumstances (namely the recurrent reallocation, the shifts to different social contexts, and the specific conditions of they work activity as regards the exact time spent at work, how isolated it is or if it develops in direct interaction with the team, and the social and leisure activities). There are also interesting opportunities to further develop the blurred frontiers that nomadism brings into people's lives such as how to manage the line that divides work from leisure (e.g. Rainoldi et al., 2025).

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Appendix

Appendix A – Questionnaire

The data collection instrument was an online questionnaire created and distributed via **Qualtrics**. The survey was anonymous, voluntary, and exclusively used for academic purposes. Completion time was approximately 4–6 minutes.

Section 1 - Introduction and Consent

Participants received an introduction describing the research purpose, estimated time, and confidentiality assurances. They were asked to provide informed consent before proceeding.

Hello, I am Olga Stikheeva, a master's student at ISCTE University Lisbon. I am conducting a survey for my master's thesis on Digital Nomad competencies. Your participation would be greatly beneficial. It is anonymous, will only be used for academic research, and it will take you only 4 minutes. Thank you for your time and contribution. Should you have any doubt please contact me at osaal4@iscte-iul.pt

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Section 2 - Screening Question

A digital nomad was defined as "someone who uses technology to work remotely and live a location-independent lifestyle, often travelling and living in different places while maintaining their career or business online."

Q1. Do you currently match this description?

- Yes
- No

Section 3 - Competency Questions

Participants rated items on a **5-point Likert scale** (1 = Strongly Disagree, 5 = Strongly Agree).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

3.1 Self-Management Skills (SMS)

Q1. I manage my time effectively, even if I have to juggle personal and professional commitments.

Q2. I organise my activities, despite any distractions in my surroundings.

Q3. I plan my activities effectively; despite disruptions I might have.

3.2 Trust-building Skills (TBS)

Q4. I complete my tasks, even with minimal supervision.

Q5. I self-manage my time ensuring to complete tasks on time and to a high standard.

Q6. I constantly abide by organisational rules and policies, even when a shortcut could help me to complete my tasks more quickly.

3.3 Advanced ICT skills

Q7. I understand when technology usage is impacting my wellbeing, even if I am very focused on some work task.

Q8. I take actions if I realise that being "always on" is becoming too much.

Q9. I use different coping strategies to deal effectively with periods of high workload.

3.4 Social Skills (SS)

Q10. I use a range of different digital communication tools to quickly build rapport with others.

Q11. I utilise a range of social networking tools to maximise my work relationships.

Q12. I build networks (including virtually) with diverse groups of people.

3.5 Emotional Skills (ES)

Q13. I avoid feeling anxious if I receive work notifications outside working hours.

Q14. I manage my working hours as I prefer, without feeling guilty for not being online when my other colleagues are.

Q15. I don't worry that my colleagues will doubt I am actually working.

3.6 Intercultural Skills (ICS)

Q16. I enjoy interacting with people from different cultures.

Q17. I am confident that I can socialise with locals in a culture that is unfamiliar to me.

Q18. I am sure I can deal with the stresses of adjusting to a culture that is new to me.

3.7 Cybersecurity Skills (CSS)

Q19. I identify the most adequate protection and security measures for various devices.

Q20. I apply various ways to protect my personal data and private life online.

Q21. I apply the adequate processes to protect institutional data.

Section 4. Meaningful Work

Items were adapted from the Work as Meaning Inventory (WAMI). Responses were given on a 5-point Likert scale.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

Q1. I have found a meaningful career.

Q2. I view my work as contributing to my personal growth.

Q3. My work really makes no difference to the world. (reverse-coded)

Q4. I understand how my work contributes to my life's meaning.

Q5. I have a good sense of what makes my job meaningful.

Q6. I know my work makes a positive difference in the world.

Q7. My work helps me better understand myself.

Q8. I have discovered work that has a satisfying purpose.

Q9. My work helps me make sense of the world around me.

Q10. The work I do serves a greater purpose.

Section 5. Demographics

Q1. Gender

- Feminine
- Masculine
- Other

Q2. Age

[open response]

Q3. Since what year have you been a digital nomad?

[open response]

Q4. Highest education level

- No formal education
- Primary/Elementary school
- Secondary/High school
- Vocational/Technical training
- Some college or university, but no degree
- Bachelor’s degree
- Master’s degree
- Ph.D.

Q5. Industry or sector of activity

(e.g., IT, Health Care, Education, etc.)

[open response]