INTERNATIONAL JOURNAL OF ENTREPRENEURIAL KNOWLEDGE
Issue 1, volume 13, ISSN 2336-2960 (Online)
www.ijek.org

CHALLENGES OF INNOVATIVE ENTREPRENEURSHIP IN A TECHNOLOGICAL ERA: AN INTEGRATIVE REVIEW

Gaelle Fitong Ketchiwou
School of Interdisciplinary Research and Graduate Studies, University of South Africa, Pretoria, South Africa
Email: gaellefit@gmail.com

Patrick Ngulube
School of Interdisciplinary Research and Graduate Studies, University of South Africa, Pretoria, South Africa
Email: Ngulup@unisa.ac.za

Received: 13 December 2024. Revision received: 18 May 2025. Accepted: 1 June 2025

ABSTRACT
The COVID-19 pandemic significantly affected entrepreneurs, compelling them to close, downsize, diversify, or adopt innovative approaches to stay afloat. This global challenge, coupled with technological disruptions, resulted in many losing their jobs and entering the competitive entrepreneurship space that requires them to be innovative to succeed. However, without the right resources, context, and environment, entrepreneurs may struggle to innovate. This paper aims to investigate the challenges to innovative entrepreneurship in a technological era. We used an integrative review to synthesize challenges to innovative entrepreneurship from 42 empirical studies in different countries worldwide. A thematic approach was used to analyse the content of the articles. Results reveal that factors related to the entrepreneur's skills and traits impede innovative entrepreneurship. Also, challenges related to finance, human resources, operational capabilities, and marketing obstruct innovation in entrepreneurship. In addition, environmental factors related to the country, social and cultural norms, and the entrepreneurship ecosystem pose challenges to innovative entrepreneurship. Innovation has become the order of the day, and knowledge of the obstacles to innovative entrepreneurship is vital. Findings can help in designing all-around support to promote innovative entrepreneurship.

KEYWORDS: Innovation, start-up, human capabilities, innovation resources, environmental enablers.

JEL CLASSIFICATION: A23, I20, I25.

Reference: Fitong Ketchiwou, G., & Ngulube, P. (2025). CHALLENGES OF INNOVATIVE ENTREPRENEURSHIP IN A TECHNOLOGICAL ERA: AN INTEGRATIVE REVIEW. *International Journal of Entrepreneurial Knowledge*, *13*(1), 23–42. Retrieved from https://ijek.org/index.php/IJEK/article/view/276

1. INTRODUCTION

Although joblessness and the job gap have fallen below pre-pandemic levels, global unemployment is rising, thereby escalating inequality and halting productivity (International Labour Organization, 2024). While this challenge persists, entrepreneurship has proven to be effective in addressing unemployment (Cakranegara *et al.*, 2022; Page & Holmström, 2023; Sampene *et al.*, 2023) and promoting self-employment (Al-Mamary *et al.*, 2020). Start-ups create new jobs for economies (Ammirato *et al.*, 2020) and have great innovation potential (Steiber *et al.,* 2020; Page & Holmström, 2023). Entrepreneurship contributes to economic growth in developed countries (Halberstadt *et al.*, 2021; Page and Holmström, 2023) and developing nations (Khan *et al.*, 2021; Makiwa & Steyn, 2020). Entrepreneurship is also a driver of economic development (Youssef *et al.*, 2021), sustainability (Bresciani *et al.*, 2021; Fernandes & Ferreira, 2022), and sustainable development (Lopes *et al.*, 2021; Makiwa & Steyn, 2020). Hence, there is a need to promote entrepreneurship (Lopes *et al.*, 2021).

The COVID-19 pandemic affected the upward and downward value chains of businesses in many ways, with a substantial impact on the downstream value chain as customers bought less or stopped buying, migrated to online channels of purchase, and new customers' needs emerged (Afshan *et al.*,

2021; Li-Ying & Nell, 2020). This resulted in a significant threat to the entrepreneurs' well-being and the finances of their businesses, which in some cases led to closure (Afshan *et al.*, 2021).

Moreso, over the last decades, rapid digital transformations have dramatically transformed businesses (UNCTAD, 2021; Wang *et al.*, 2022) and customer demands (AlTaweel & Al-Hawary, 2021; Distanont and Khongmalai, 2020; Urbig *et al.*, 2020). New technologies have also created massive entrepreneurial opportunities (Herve *et al.*, 2020). Likewise, increased competition has compelled organisations to design approaches to maximize returns and improve their competitiveness through innovation (Lin *et al.*, 2020; AlTaweel & Al-Hawary, 2021). Hence, entrepreneurs who want to remain competitive must innovate (Distanont & Khongmalai, 2020; Urbig *et al.*, 2020) as they recover from COVID-19 and adapt to the new normal (Meyer *et al.*, 2021; Sharma *et al.*, 2022).

Despite the importance of entrepreneurship, little attention has been given to nascent entrepreneurs and the obstacles they encounter in innovation (Epede & Wang, 2022; Etemad, 2020; Smallbone *et al.*, 2022). Also, there has been limited research on entrepreneurship and innovation simultaneously, hence the need for both concepts to be researched together within the current digital era (Berger *et al.*, 2021). Therefore, this research aims to conduct an integrative review of challenges to innovative entrepreneurship in a technological era.

2. THEORETICAL UNDERPINNING

This article is anchored on Schumpeter's Theory of Innovation and the Resource-Based View theory. According to Schumpeter's Theory of Innovation, entrepreneurs are creative destructors who possess innovation capabilities that empower them to create new combinations to satisfy customers, make profits, succeed, and promote economic growth (Śledzik, 2013; Ziemnowicz, 2013). The resource-based view theory purports that the performance of a firm is directly proportional to its unique combination of heterogeneous, rare, non-substitutable, and inimitable resources that can serve as a competitive advantage over other firms (Barney, 1991; Kruesi & Bazelmans, 2023). These resources guarantee the firm's dynamic ability to face business and environmental turbulence (Al-Awamleh *et al.*, 2022; Alolayyan *et al.*, 2022). These two theories imply that although entrepreneurs are expected to be innovative, they require the right combination of resources to achieve this. Access to such resources will determine the level to which they can innovate, compete, and survive.

3. LITERATURE REVIEW

3.1 Entrepreneurship and innovation

Entrepreneurship can be defined as the value-creating process of evaluating business prospects, taking calculated risks, and investing to produce innovative outputs (Hang & Chen, 2021; Page & Holmström, 2023). Inasmuch as new venture creation is important, it is even more vital for startups to remain profitable and sustainable (Orobia *et al.*, 2020). Innovation can help organisations in this regard.

Innovation includes developing a new product, adopting a new production method, developing or revamping a market, using a new input factor, or instituting a new organisational structure (Nawawi*et al.*, 2022; Schmitz *et al.*, 2023). Innovation usually starts with an idea, followed by the development of the idea, and ends with an enhanced process, product, service, or technology (Kearney, 2022; Nawawi *et al.*, 2022; Ratten & Usmanji, 2020).

3. 2 Drivers of innovative entrepreneurship

Innovative entrepreneurship is challenged by factors related to the entrepreneur, the business, and the environment.

3.2.1 The entrepreneur

Start-up education is needed for innovation in entrepreneurship (Kurniati & Suryanto, 2023; Wardana *et al.*, 2020). Also, the entrepreneurial mindset affects innovation, which often comprises various emotional, behavioural, and cognitive components (Kuratko *et al.*, 2021; Kuratko *et al.*, 2021b). Cognitive abilities such as self-efficacy, willingness to take risks, and the ability to identify opportunities form the cognitive components of the entrepreneurial mindset. Innovation requires creativity and divergent thinking (Lin *et al.*, 2020; Shadiev *et al.*, 2022), and the ability to assimilate new technologies (Szczepańska-Woszczyna & Gatnar, 2022), which skilled business owners can learn easily (Setini *et al.*, 2020). Hence, digital competencies are essential for entrepreneurship (Ratten & Usmanji, 2020). Also, innovation within entrepreneurship depends on the entrepreneurs' characteristics such as personality, attitude, motivation, interest, level of education, and prior experiences (Oberländer *et al.*, 2020). Thus, the competencies and the traits of the entrepreneur impact innovation and the innovation process within the new venture (Byukusenge *et al.*, 2021).

3.2.2 Business factors

Internal barriers within the organisation can impair innovation in entrepreneurship. Limited financial resources, technological resources, inadequately skilled employees, and high levels of risk affect the ability of ambitious entrepreneurs to pursue innovation opportunities (de Moraes Silva *et al.*, 2022; Pindado *et al.*, 2023; Ruiz-Jiménez *et al.*, 2021). Funding has proven to be a significant obstacle to innovation (Ashourizadeh *et al.*, 2022; Molina-Garcia *et al.*, 2023). Also, the conflict between fostering innovation and risk aversion (by managers and business owners) creates innovation uncertainty (Alrawad *et al.*, 2023). Thus, leadership is critical for entrepreneurship innovation (Erhan *et al.*, 2022). Also, innovation requires managers and employees to have specific knowledge, skills, and competencies (Byukusenge *et al.*, 2021; Oberländer *et al.*, 2020). This finding aligns with research that reveals human resources as the most significant barriers to innovation (Fritsch *et al.*, 2022; Torres de Oliveira *et al.*, 2022). Moreover, digital infrastructure can impact entrepreneurs' affordable and timely access to resources, knowledge, and technical expertise (Cirillo *et al.*, 2021). Also, the lack of resources may hinder innovation because decision-making in the innovation process requires executives to conduct an environmental analysis, identify innovation opportunities, and use available resources to leverage these opportunities (Zhou *et al.*, 2021).

3.2.3 Environmental factors

Environmental obstacles to a firm's innovation could include economic uncertainty, government policies, and global competition (Clausen, 2020; Hameed *et al.*, 2021; Thukral, 2021). Government support in the form of financial, technical, and adequate policies can help entrepreneurs overcome financial and knowledge barriers to innovation, thereby facilitating innovation (Liu *et al.*, 2022; Mohamad *et al.*, 2022). While digital technology is an external enabler of entrepreneurship (Elia *et al.*, 2020), ICT is critical for entrepreneurs (Afshan *et al.*, 2021). Stable and expanding economies have the potential to provide the financial resources required for entrepreneurs to embrace innovation and new technologies (Kiani *et al.*, 2022). The lack thereof is often detrimental to start-ups. Also, market dynamics drive innovation and are indissolubly linked to the prevailing economic conditions (Akpan *et al.*, 2022). An expanding economy increases consumer demand and prompts entrepreneurs to develop new products and services to meet changing preferences (Elia *et al.*, 2020; He *et al.*, 2020; Teirlinck, 2022). Likewise, a stagnant or regressing economy can suffocate new ventures.

Partnerships are also essential for entrepreneurial innovation (Kurniati & Suryanto, 2023) because they provide access to vital resources necessary for innovation, such as finance, technical expertise, technological capabilities, market intelligence, and commercialisation (Katila *et al.*, 2022; Toxopeus *et al.*, 2021). In the same vein, business partnerships enable new entrepreneurs to build networks, thereby unlocking opportunities, resources, and market knowledge (Battisti *et al.*, 2022). Entrepreneurs in partnerships in the form of strategic alliances (Klein & Todesco, 2021), collaboration with universities (Apa *et al.*, 2021), and enterprise clusters (Martinez-Chafer *et al.*, 2023) are more likely to innovate or launch new products and services. An established comprehensive communication network between corporate partners can increase innovation (Klein *et al.*, 2022). Moreover, the prevailing national culture and the functioning of existing support institutions are critical for entrepreneurs (Elia *et al.*, 2020).

While factors relating to the entrepreneur will affect their ability to innovate, factors within the business, as well as environmental factors, also have a great role to play. Entrepreneurial businesses are fragile due to their small size (Gimenez-Fernandez et al., 2020), especially in times of crisis (Kuckertz et al., 2020; Stephens et al., 2021), and are also defenceless and powerless when confronted with challenges (Ismail, 2022). The advent of disruptive technologies and the COVID-19 pandemic have challenged entrepreneurship in so many ways. Hence, the need to review challenges to innovative entrepreneurship.

4. METHODS

An integrative review approach was used in this paper. This approach is appropriate to critically evaluate, integrate, and synthesize data (Fan *et al.*, 2022) from different sources of published materials (Kutcher & LeBaron, 2022) to answer a research question about the challenges of innovative entrepreneurship in a technological era (Fan *et al.* 2022; Kutcher & LeBaron, 2022). With this approach, researchers can use a non-systematic method to review and synthesize literature to generate new perspectives, provide insights, advance new knowledge, and generate a new framework (Snyder, 2019).

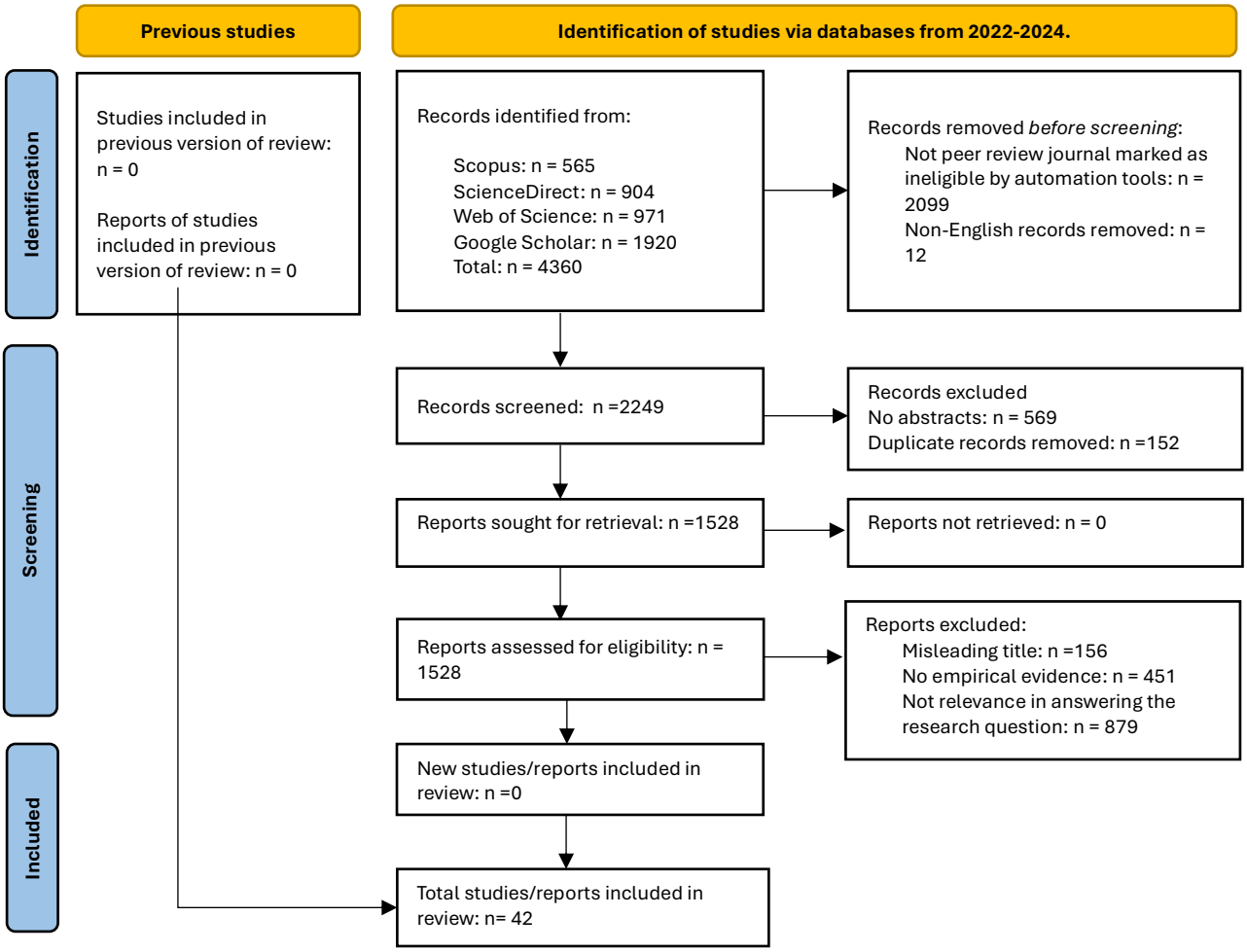
However, there is often confusion as to how integrative reviews create new theoretical insights through the integration process (Fan *et al.*,2022). Hence, standards and guidelines for developing a strategy for integrative reviews can counter the argument on the limited amount of rigor employed in this review process, therefore, researchers need to follow accepted conventions to report how the study was conducted (Snyder, 2019). For this reason, we used the 7 sequential steps suggested by Kutcher and LeBaron (2022), which include selecting a concept, deciding on the purpose of the review, searching the literature, organising and evaluating data, analysing and synthesizing findings, summarising results, as well as discussing conclusions and disseminating the findings. Step 1 has been covered in the section on literature review, and step 2 was covered in the introduction section above. The other steps are covered in the subsequent sections.

4.1 Literature search

Replicability is important in integrative reviews; hence, researchers need to disclose the search, selection, inclusion, and exclusion criteria, and the number of articles found during the search (Fan *et al.*, 2022). ScienceDirect, Scopus, Google Scholar, and Web of Science were searched using the search strings "entrepreneurship" OR "new venture" OR "startup" OR "entrepreneur" AND "4IR" OR "digital transformation" OR "industry 4.0" AND "innovation" OR "improvement" OR "invention" AND "Challenge*" OR "Difficulties" OR "Problems" OR "Obstacles".

The inclusion criteria were empirical articles published in English in peer-reviewed journals from 2022 to 2024. In the same vein, we excluded non-English articles, non-empirical studies, published materials that are not articles, or articles published before 2022 or after 2024. By limiting the review to the last 3 years, we capture the most current research and developments on the challenges faced in innovative entrepreneurship within a period where entrepreneurs continuously need to adopt new technologies and reshape to respond to global economic and technological shifts. Findings from this study can provide insight for stakeholders and policymakers to make informed decisions to tackle existing obstacles and promote innovative entrepreneurship within a volatile environment and maybe prepare for future unforeseen disruptions.

Figure 1: **Prisma protocol for the study**



(*Source*: Prisma protocol adapted from Page et al., 2021)

The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA 2020) was used in this review (Page *et al.*, 2021). This protocol provides a transparent, accurate, and complete account of the review and findings. The selection process is presented in the PRISMA protocol in Figure 1.

4.2 Organising and evaluating data

The researchers screened 4360 articles using the Cadima web tool to identify duplicates and conduct a preliminary screening of abstracts (Cadima, 2023). Titles and abstracts were assessed. Only articles relevant to answering the research questions and that met the inclusion criteria were read in full. We assessed articles using the Mixed Methods Appraisal Tool proposed by Hong *et al.* (2018), which is ideal

for evaluating quantitative, qualitative, and mixed-methods research articles. This tool assesses the clarity of purpose, alignment with methods, measures, measuring instruments, findings, interpretation of findings, and coherence. Finally, forty-two articles were retained for the study. Each article was reviewed, and relevant data were extracted and exported to a Microsoft Excel spreadsheet.

4.3 Analysing and synthesizing findings

Of the forty-two studies, nineteen used a qualitative method, twenty used a quantitative approach, and three used a mixed methods approach. These studies covered different industries in Argentina, Austria, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Denmark, Ecuador, Egypt, Finland, France, Germany, Greece, Hungary, India, Indonesia, Iran, Iraq, Israel, Italy, Lebanon, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Peru, Poland, Qatar, Romania, Russia, Saudi Arabia, Slovenia, South Africa, Sweden, Switzerland, Thailand, Turkey, and United Kingdom. Thus, there was a spread of the studies around the globe with most continents represented (see Figure 2, which was generated using a map chart function in Microsoft Excel).

We used a thematic analysis approach to classify commonalities (Fan *et al.*, 2023). This approach is ideal for integrative reviews because it allows us to efficiently analyse data from reviewed articles in a flexible way that facilitates synthesis (Snyder, 2019).

Figure 2: **The spread of articles around the world**

Legend	
No country represented	
Country represented	

(*Source*: Authors from analysed data)

We searched for words, concepts, and relationships to form codes (see Table 1). We used the colour coding function in Microsoft Excel to systematically group data into different clusters, which led to the development of three broad themes: i.e., challenges related to the entrepreneur, challenges related to the business venture, and external or environmental challenges, with each theme having subthemes

under it. This transparent process guaranteed a credible interpretation of findings and conclusions (Fan *et al.*, 2023; Snyder, 2019).

The full biographical information of the articles reviewed is presented in Table 1 in the supplementary file (Supplementary file, 2025).

Table 1: **Challenges of innovative entrepreneurship in a technological era**

Challenges	References	Reference counts
ENTREPRENEUR		
Entrepreneur skills		
Lack of entrepreneurship knowledge/skills	Ameen *et al.*, 2023; Constantin & Kavoura, 2022; Gabrielsson *et al.*, 2022; Kames *et al.* 2023; Oyinlola *et al.*, 2024; Rajiani *et al.*, 2023; Tao & Zhuang, 2023; Wibowo, 2023	8
Lack of entrepreneurship education, training, and development (including coaches, mentors)	Ameen *et al.*, 2023; Khoo *et al.*, 2024; Oyinlola *et al.*, 2024; Purg, 2023; Tao & Zhuang, 2023)	5
Insufficient technological/ digital skills	Farroñán *et al.*, 2024; Khoo *et al.*, 2024; Rajiani *et al.*, 2023; Yadav *et al.*, 2023	4
Lack of self-management skills	Dopelt *et al.*, 2023; Yadav *et al.*, 2023	2
Lack of business skills	Stephens & Wolf, 2023; Tao & Zhuang, 2023; Yadav *et al.*, 2023	3
Lack of skills to secure finance	Kames *et al.* 2023; Yadav *et al.*, 2023; Zhou *et al.*, 2022	3
Lack of creativity/ innovativeness	Haojie, 2022; Oyinlola *et al.*, 2024; Stephens & Wolf, 2023; Tao & Zhuang, 2023	4
Entrepreneur's traits		
Lack of focus/ direction	Stephens & Wolf, 2023; Tao & Zhuang, 2023	2
Pessimism	Alhothali & Al-Dajani, 2022; Oyinlola *et al.*, 2024	2
Lack of self-confidence	Rajiani *et al.*, 2023; Tao & Zhuang, 2023	2
Dearth of the right entrepreneurship mindset	Oyinlola *et al.*, 2024; Stephens & Miller, 2023; Yadav *et al.*, 2023	4
Lack of determination, diligence, and perseverance	Butticè *et al.*, 2023; Khoo *et al.*, 2024; Stephens & Miller, 2023; Tao & Zhuang, 2023; Yadav *et al.*, 2023	5
Risk aversion	Butticè *et al.*, 2023; Dabbous & Boustani, 2023; Khoo *et al.*, 2024	3
THE BUSINESS		
Finance		
Difficulty in obtaining funding	Ameen *et al.*, 2023; Constantin & Kavoura, 2022; Dopelt *et al.*, 2023; Farroñán *et al.*, 2024; Fotis & Kamariotou, 2023; Kames *et al.* 2023; Manríquez, 2022; Oyinlola *et al.*, 2024; Primario *et al.*, 2024; Qin, 2024; Rajiani *et al.*, 2023; Rajkamal *et al.*, 2022; Sala-Vilar,	18

	2024; Saqib & Shah, 2023; Sharma *et al.*, 2023; Stephens & Wolf, 2023; Tao & Zhuang, 2023; Yadav *et al.*, 2023	
Innovation costs are often high.	Butticè *et al.*, 2023; Kames *et al.* 2023; Oyinlola *et al.*, 2024; Sharma *et al.*, 2023; Qin, 2024; Yadav *et al.*, 2023; Zhou *et al.*, 2022	7
Low starting revenue	Apostolopoulos *et al.*, 2022; Constantin & Kavoura, 2022; Purg, 2023; Yadav *et al.*, 2023	4
High risk/uncertainty	Ajah, 2023; Apostolopoulos *et al.*, 2022; Constantin & Kavoura, 2022; Fotis & Kamariotou, 2023; Kames *et al.* 2023; Primario *et al.*, 2024; Rothe at al., 2023; Sharma *et al.*, 2023; Stephens & Miller, 2023	9
High cost and availability of loans	Amirmahmood, 2022; Rajiani *et al.*, 2023	2
Human skills		
Limited business skills	Butticè *et al.*, 2023; Kames *et al.* 2023; Tao & Zhuang, 2023; Yao, *et al*, 2023	4
Lack of innovative skills in teams	Kames *et al.* 2023; Purg, 2023; Rajiani *et al.*, 2023; Rajkamal *et al.*, 2022; Sharma *et al.*, 2023; Tao & Zhuang, 2023	5
Lack of digital capabilities	Amirmahmood, 2022; Manríquez, 2022; Martin, 2024; Butticè *et al.*, 2023; Sala-Vilar, 2024; Xu *et al.*, 2022	5
Lack of relevant human capital	Kames *et al.* 2023; Martin, 2024; Murmann, 2023; Rajkamal *et al.*, 2022; Sala-Vilar, 2024; Qin, 2024	6
Work overload	Butticè *et al.*, 2023; Petzsche *et al.*, 2023	2
Lack of marketing skills	Amirmahmood, 2022; Kames *et al.* 2023; Fotis & Kamariotou, 2023; Rajkamal *et al.*, 2022; Tao & Zhuang, 2023	4
Operational capability		
Limited logistics, tools, and infrastructural resources	Alhothali & Al-Dajani, 2022; Amirmahmood, 2022	17
Limited adaptability	Kames *et al.* 2023; Martin, 2024; Primario *et al.*, 2024	3
Lack of raw material	Alhothali & Al-Dajani, 2022; Kames *et al.* 2023; Rajiani *et al.*, 2023	3
Lack of organisational strategic alignment to innovation	Kames *et al.* 2023; Purg, 2023; Rajiani *et al.*, 2023; Sala-Vilar, 2024	4
Long development time	Dopelt *et al.*, 2023; Kames *et al.* 2023; Rajkamal *et al.*, 2022	3
Defects or errors at the start	Rajkamal *et al.*, 2022; Shipway, 2023; Yadav *et al.*, 2023; Zhou *et al.*, 2022	4
Long lead/ time-to-market	Kames *et al.* 2023; Fotis & Kamariotou, 2023; Rajkamal *et al.*, 2022; Sala-Vilar, 2024; Sharma *et al.*, 2023	5
Limited access to supporting technology	Ameen *et al.*, 2023; Amirmahmood, 2022; Apostolopoulos *et al.*, 2022; Constantin &	8

	Kavoura, 2022; Farroñán *et al.*, 2024; Manríquez, 2022; Stephens & Wolf, 2023; Yadav *et al.*, 2023	
Challenging protocol around patenting and intellectual property protection	Ameen *et al.*, 2023; Apostolopoulos *et al.*, 2022; Kames *et al.* 2023; Purg, 2023; Rajkamal *et al.*, 2022; Yadav *et al.*, 2023; Zhou *et al.*, 2022	7
Concerns around safety, security	Butticè *et al.*, 2023; Petzsche *et al.*, 2023; Qin, 2024; Zhou *et al.*, 2022	4
No innovation methodology in place	Kames *et al.* 2023; Purg, 2023; Rajiani *et al.*, 2023; Sala-Vilar, 2024	4
Marketing		
Difficulties in market development	Alhothali & Al-Dajani, 2022; Hasan *et al.*, 2022; Kames *et al.* 2023; Tao & Zhuang, 2023; Yadav *et al.*, 2023	5
Access to market/channels	Amirmahmood, 2022; Fotis & Kamariotou, 2023; Kames *et al.* 2023; Manríquez, 2022; Purg, 2023; Rajiani *et al.*, 2023; Rajkamal *et al.*, 2022; Yadav *et al.*, 2023	5
ENVIRONMENTAL FACTORS		
Country		
Low technological readiness in the country	Amirmahmood, 2022; Apostolopoulos *et al.*, 2022; Manríquez, 2022; Yadav *et al.*, 2023; Sala-Vilar, 2024; Qin, 2024; Shipway, 2023	7
Low-Country digital infrastructural development	Amirmahmood, 2022; Apostolopoulos *et al.*, 2022; Butticè *et al.*, 2023; Haojie, 2022; Sala-Vilar, 2024; Qin, 2024	6
Unfavourable political conditions	Ameen *et al.*, 2023; Oyinlola *et al.*, 2024; Stephens & Wolf, 2023	3
Poverty and unstable economic conditions	Amirmahmood, 2022; Oyinlola *et al.*, 2024; Rajiani *et al.*, 2023; Stephens & Miller, 2023; Utomo & Susanta, 2022; Yadav *et al.*, 2023	6
Inadequate legal coverage, e.g., policy, legal, and regulatory environment	Ajah, 2023; Ameen *et al.*, 2023; Amirmahmood, 2022; Apostolopoulos *et al.*, 2022; Dopelt *et al.*, 2023; Polas *et al.*, 2022; Shipway, 2023; Qin, 2024; Tao & Zhuang, 2023	9
Insufficient government support (e.g., finance assistance, mentorship, incubators, training, resources, systems, etc.)	Ameen *et al.*, 2023; Amirmahmood, 2022; Oyinlola *et al.*, 2024; Kames *et al.* 2023; Khoo *et al.*, 2024; Qin, 2024; Rajiani *et al.*, 2023; Yadav *et al.*, 2023	9
Societal and cultural factors		
Societal and cultural restrictions, e.g., gender discrimination/stereotypes against women	Ameen *et al.*, 2023; Butticè *et al.*, 2023; Farroñán *et al.*, 2024; Tao & Zhuang, 2023; Qin, 2024	5
Entrepreneurship ecosystem		
Difficulty or inadequate collaboration within the	Kames *et al.* 2023; Manríquez, 2022; Oyinlola *et al.*, 2024; Purg, 2023; Sala-Vilar,	9

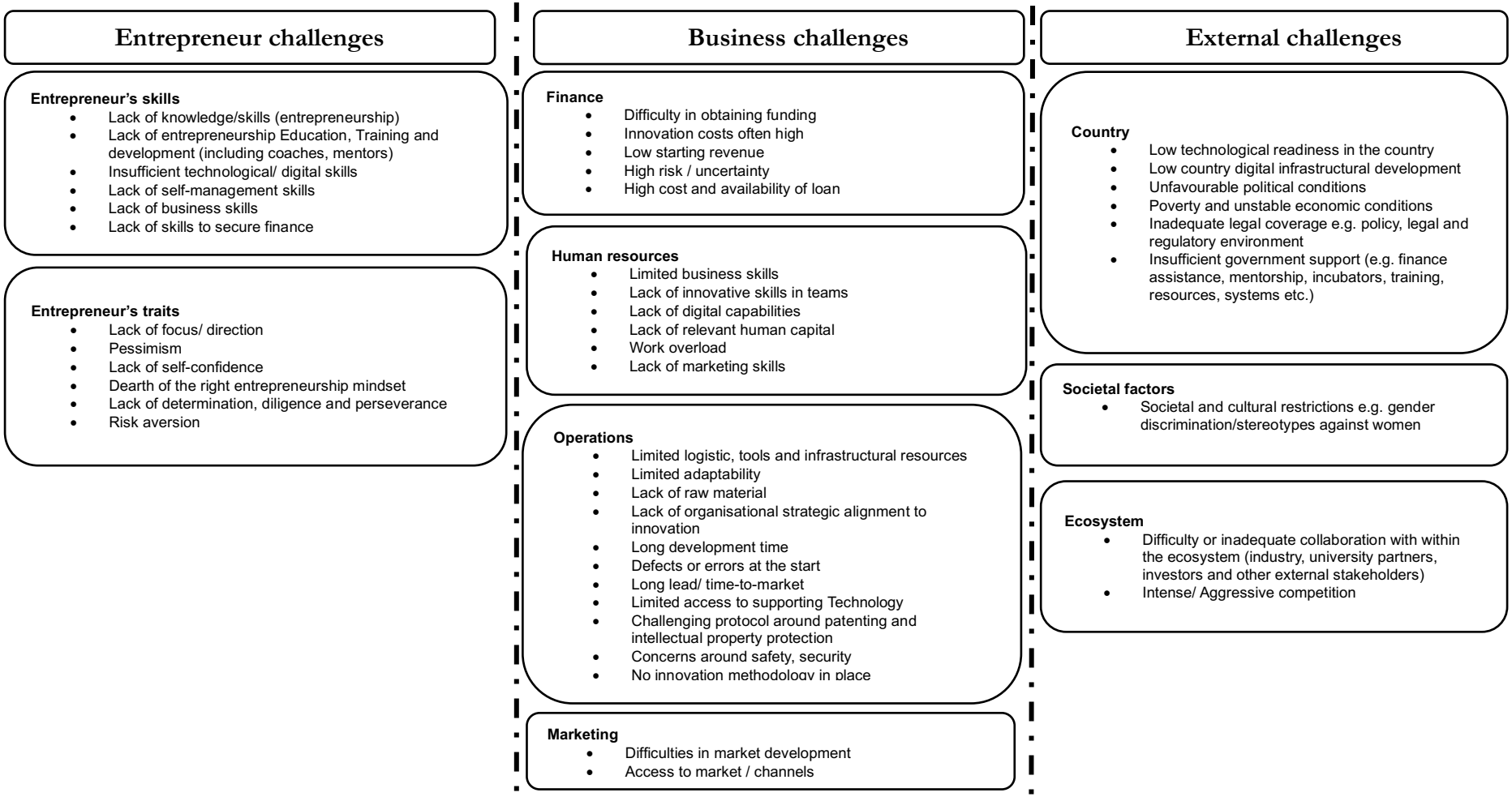
ecosystem (industry, university partners, investors, and other external stakeholders)	2024; Qin, 2024	
Intense/ Aggressive competition	Ajah, 2023; Dopelt *et al.*, 2023; Farroñán *et al.*, 2024; Fotis & Kamariotou, 2023; Hasan *et al.*, 2022; Kames *et al.* 2023; Polas *et al.*, 2022; Primario *et al.*, 2024; Yadav *et al.*, 2023	9

(*Source*: Authors)

5. SUMMARISING RESULTS

Results reveal that factors related to the entrepreneur's traits and skills impede innovation in entrepreneurship. Likewise, factors related to the business, including finance, human skills, operational capabilities, and marketing, obstruct innovation in entrepreneurship. In addition, environmental factors related to the nation, social dynamics, and cultural norms, as well as the entrepreneurship ecosystem, pose challenges to innovative entrepreneurship. The Microsoft Word tool was used to present results visually (see Figure 3).

Figure 3 **Challenges in innovative entrepreneurship in a technological era**



(*Source*: Authors)

6. DISCUSSIONS

This section discusses findings from this review in the light of the broader academic discourse.

6.1 Entrepreneur-related challenges

Findings from this study show that the lack of entrepreneurship knowledge/skills and education, insufficient technological skills, lack of self-management skills, lack of business skills, and inability to secure finance impede innovative entrepreneurship. Prior research confirms that the competencies and skills of the entrepreneur play a vital role in their ability to innovate (Byukusenge *et al.*, 2021). Kurniati and Suryanto (2023) and Wardana *et al.* (2020) confirm that entrepreneurs need the right education to innovate. Having skills in innovation, business, creativity, and the ability to think divergently are vital for innovation (Lin *et al.*, 2020; Shadiev *et al.*, 2022). Past research also confirms that digital competencies have the potential to empower entrepreneurs to become innovative (Ratten & Usmanji, 2020; Setini *et al.*, 2020; Szczepańska-Woszczyna & Gatnar, 2022).

Likewise, this review reveals that traits of the entrepreneur, including lack of focus, pessimism, low self-confidence, dearth of the right entrepreneurial mindset, lack of determination, lack of diligence, lack of perseverance, and risk aversion, obstruct innovative entrepreneurship. This finding is in tandem with past studies, which reveal that an entrepreneurial mindset together with cognitive abilities such as emotion, self-efficacy, willingness to take risks, and the ability to identify opportunities are critical for innovation in entrepreneurship (Kuratko, Fisher, *et al.*, 2021; Kuratko *et al*, 2021b; Oberländer *et al.*, 2020). The lack of these competencies and traits poses a challenge to the entrepreneur's ability to innovate.

6.2 Business-related challenges

Results reveal that financial impediments linked to the difficulty in obtaining funding and loans, high cost of loans, high innovation costs, low starting revenue, and high uncertainty hamper innovative entrepreneurship. Prior research confirms that funding is a major obstacle to innovation (Ashourizadeh *et al.*, 2022; Molina-Garcia *et al.*, 2023; Pindado *et al.*, 2023). Many entrepreneurs struggle to secure the funds needed for them to engage in innovation, which limits their ability to innovate.

Also, the review shows that human resource challenges impede innovation within a business. These include limited business skills, lack of innovative skills, lack of digital capabilities, lack of human capital with relevant skills to drive innovation, work overload, and lack of marketing skills. Past research affirms that an inadequate combination of skills, knowledge, and expertise in employees (Cirillo *et al.*, 2021; Fritsch *et al.*, 2022; Torres de Oliveira *et al.*, 2022; Oberländer *et al.*, 2020; Pindado *et al.*, 2023; Ruiz-Jiménez *et al.*, 2021) and incompetent leadership can potentially hinder innovation in entrepreneurship (Byukusenge *et al.*, 2021; Erhan *et al.*, 2022). Hence, the lack of competent human capital is detrimental to innovation.

In addition, findings reveal that operational challenges hinder innovation in entrepreneurial businesses. They include limited logistics, tools, infrastructure, inadaptability, lack of raw material, lack of organisational strategic alignment to innovation, long development time, defects or errors, long lead time, limited access to supporting technology, difficulties around patent and intellectual property protection, and concerns around safety and security. Cirillo *et al.* (2021) and Clausen (2020) confirm that limited access to relevant resources obstructs innovation in start-ups. Limited technological resources and digital infrastructures hinder innovation in entrepreneurial businesses (Cirillo *et al.*, 2021; Pindado *et al.*, 2023; Ruiz-Jiménez *et al.*, 2021). High levels of risk create innovation uncertainties (de Moraes Silva *et al.*, 2022; Pindado *et al.*, 2023; Ruiz-Jiménez *et al.*, 2021), and risk-aversion mentality

limits small businesses' ability to engage in innovative processes and activities (Alrawad *et al.*, 2023). Hence, the need for the right leadership to drive innovation in entrepreneurial businesses (Byukusenge *et al.*, 2021; Erhan *et al.*, 2022).

Moreover, marketing challenges related to limited access to markets and the development of markets hinder innovative entrepreneurship. Previous scholars affirm that fierce competition, restricts access to customers who are willing and able to purchase the innovation, which may deter businesses from innovating (Alrawad *et al.*, 2023; Clausen, 2020; Hameed *et al.*, 2021; Thukral, 2021). Even though new technologies have given entrepreneurs access to marketing and distribution prospects (Islam *et al.*, 2020; Liu *et al.*, 2021; Schiavone *et al.*, 2021), access to the market remains a challenge that creates uncertainties about the marketability of their innovative product or service.

6.3 Environmental challenges

Findings from the review also reveal that country-related challenges such as low technological readiness, low digital infrastructural development, unfavourable political conditions, poverty, unstable economic conditions, inadequate legal coverage, and insufficient government support negatively affect innovative entrepreneurship. This result is in tandem with past research, which affirms that economic uncertainty and government policy can adversely affect the ability of entrepreneurial businesses to innovate (Clausen, 2020; Hameed *et al.*, 2021; He *et al.*, 2020; Kiani *et al.*, 2022; Teirlinck, 2022; Thukral, 2021). Limited financial, technical, and policy support from the government can accentuate barriers to innovation (Liu *et al.*, 2022; Mohamad *et al.*, 2022). Also, state of ICT plays a critical role in innovative entrepreneurship in countries (Afshan *et al.*, 2021; Elia *et al.*, 2020).

In the same vein, societal and cultural restrictions such as gender discrimination/stereotypes against women hinder innovative entrepreneurship. This is confirmed by past research findings revealing that the prevailing culture influences entrepreneurship innovation (Corrente *et al.*, 2019; Hermanto & Suryanto, 2020; Stam & van de Ven, 2021). Therefore, the overall culture upheld by a society can impact access to resources, skills, and knowledge relevant for innovative entrepreneurship.

Finally, inadequate collaboration within the ecosystem and aggressive competition negatively affect entrepreneurs' ability to innovate. Prior research confirms that limited business networks (de Moraes Silva *et al.*, 2022; Pindado *et al.*, 2023; Ruiz-Jiménez *et al.*, 2021) and limited partnerships hinder innovation in entrepreneurship (Klein *et al.*, 2022; Kurniati & Suryanto, 2023). Without partnerships and collaborations, entrepreneurs may not be able to access finance, technical expertise, technological capabilities, market intelligence, and commercialisation resources needed in the innovation journey (Battisti *et al.*, 2022; Katila *et al.*, 2022; Martinez-Chafer *et al.*, 2023; Toxopeus *et al.*, 2021). Previous studies also affirm that aggressive competition (Clausen, 2020; Hameed *et al.*, 2021; Ismail, 2022; Thukral, 2021) and market dynamics (Akpan *et al.*, 2022) hinder innovation for small businesses. Thus, the external environment within which an entrepreneurial business operates is a critical determinant of its innovative capabilities.

In line with Schumpeter's theory of innovation (Śledzik, 2013; Ziemnowicz, 2013) and the Resource-Based View theory (Barney, 1991; Kruesi & Bazelmans, 2023), this study confirms that though entrepreneurs are creative by nature, they need the right internal and external resources to be able to innovate in this technological era. The lack of such resources will obstruct innovative entrepreneurship.

7. CONCLUSIONS AND DISSEMINATION OF FINDINGS

This paper aimed to review challenges to innovative entrepreneurship in a technological era. Schumpeter's Theory of Innovation and the Resource-Based View theory were used as a theoretical lens to understand the phenomenon. The integrative review reveals that although entrepreneurs are by default expected to be innovative, tangible and intangible resources related to the entrepreneur impede innovation in entrepreneurship (i.e., entrepreneurs' traits and skills). Moreover, finance, human resources, operational capabilities, and marketing factors can obstruct innovation within an entrepreneurial business. In addition, external factors within the country, social and cultural norms, and the entrepreneurship ecosystem could pose challenges to innovative entrepreneurship.

Luckily, innovative entrepreneurship traits and competencies can be developed through education, coaching, and mentorship. Governments and educational institutions should provide community training programmes aimed at developing relevant traits and skills that can promote entrepreneurship and innovation.. Such initiatives could be beneficial to African countries with high unemployment rates , especially if special attention is given to youths and women, who form the greatest portion of the unemployed in most developing countries. Also, relevant support should be provided to existing and emerging entrepreneurial businesses to enhance their innovativeness. Financial support, access to loans, and interest-free loans will go a long way. Imperative to this is the operational capacity that needs to be developed through the provision of the right tools, resources, and processes that facilitate innovation. This should go together with the development of humans to equip them with relevant innovative competencies. One way of tackling this is to roll out national skills development programmes that target employees in small businesses and entrepreneurs to teach them how to innovate. Governments can also create platforms and channels where entrepreneurs can market their products nationally and internationally. Such marketing support is relevant in securing markets for new products and partnerships for innovation. Furthermore, governments should promote technological developments and the use of innovative technologies at the national level and provide supporting infrastructures to match the ongoing technological revolutions. Hence, innovative entrepreneurship will require a robust policy framework. Countries seeking economic sustainability should invest in improving conditions that particularly boost entrepreneurship and innovation, making available the required capital and infrastructure, developing the right labour force, and facilitating access to raw materials and markets.

8. STUDY LIMITATIONS AND RECOMMENDATIONS

Although we conducted a rigorous review, the selection criteria, the review timeframe and keywords used during the search could have restricted access to some relevant articles. Future research could consider validating these findings by using a quantitative or qualitative approach to investigate challenges to innovative entrepreneurship in specific industries or regions.

REFERENCES

Afshan, G., Shahid, S. & Tunio, M.N. (2021). Learning experiences of women entrepreneurs amidst COVID-19. *International Journal of Gender and Entrepreneurship*, 13(2), 162- 186. https://doi.org/10.1108/IJGE-09-2020-0153

Akpan, I.J., Udoh, E.A.P. & Adebisi, B. (2022). Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic. *Journal of Small Business and Entrepreneurship,* 34(2), 123-140.

Al-Awamleh, H., Alhalalmeh, M., Alatyat, Z., Saraireh, S., Akour, I., Alneimat, S. & Al-Hawary, S. (2022). The effect of green supply chain on sustainability: Evidence from the pharmaceutical industry. *Uncertain Supply Chain Management*, *10*(4), 1261-1270

Al-Mamary Y.H., Mohammed A., Alwaheeb, N.G.M., Alshammari, M.A., Hamad, B. & Soltane H.B. (2020). The effect of entrepreneurial orientation on financial and non-financial performance in Saudi SMES: A review. *Journal of Critical Reviews* 7, 270–78.

Alolayyan, M., Al-Rwaidan, R., Hamadneh, S., Ahmad, A., AlHamad, A., Al-Hawary, S. & Alshurideh, M. (2022). The mediating role of operational Flexibility on the relationship between quality of health information technology and management capability. *Uncertain Supply Chain Management*, *10*(4), 1131-1140.

Alrawad, M., Lutfi, A., Almaiah, M.A., Alsyouf, A., Al-Khasawneh, A.L., Arafa, H.M., Ahmed, A.N., AboAlkhair, A.M. & Tork, M. (2023). Managers' perception and attitude toward financial risks associated with SMEs: Analytic hierarchy process approach. *Journal of Risk and Financial Management*, 16(2), 86. https://doi.org/10.3390/jrfm16020086

AlTaweel, I.R. & Al-Hawary, S.I. (2021). The Mediating Role of Innovation Capability on the Relationship between Strategic Agility and Organizational Performance. *Sustainability*, *13*(14), 7564.

Ammirato, S., Sofo, F., Felicetti, A.M., Helander, N. & Aramo-Immonen, H. (2020). A new typology to characterize Italian digital entrepreneurs. *Int J Entrepreneurial Behav Res* 26(2), 224–245.

Apa, R., De Marchi, V., Grandinetti, R. & Sedita, S.R. (2021). University-SME collaboration and innovation performance: The role of informal relationships and absorptive capacity. *The Journal of Technology Transfer* 46(4): 961-988. https://doi.org/101007/s10961-020-09802-9

Ashourizadeh, S., Saeedikiya, M., Aeeni, Z. & Temiz, S. (2022). Formal sources of finance boost innovation: Do immigrants benefit as much as natives? *Entrepreneurial Business and Economics Review*, *10*(2), 41-59.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.

Battisti, S., Agarwal, N. & Brem, A. (2022). Creating new tech entrepreneurs with digital platforms: Meta-organizations for shared value in data-driven retail ecosystems. *Technological Forecasting and Social Change* 175. https://doi.org/101016/jtechfore2021121392

Berger, E.S., von Briel, F., Davidsson, P. & Kuckertz, A. (2021). Digital or not–the future of entrepreneurship and innovation: Introduction to the special issue. *Journal of Business Research*, 125, 436–442. https://doi.org/10.1016/j.jbusres.2019.12.020

Bresciani, S., Puertas, R., Ferraris, A. & Santoro, G. (2021) Innovation, environmental sustainability and economic development: DEA-Bootstrap and multilevel analysis to compare two regions. *Technol Forecast Soc Change* 172:121040. https://doi.org/10.1016/j.techfore.2021.121040

Byukusenge, E., Munene, J.C. & Orobia, L.A. (2021). Managerial competencies and business performance: Innovation as a mediator in Rwandan SMEs. *International Journal of Law and Management*, 63(5), 445–463. https://doi.org/10.1108/IJLMA-09-2017-0217

Cadima (2023). Cadima. Retrieved from https://www.cadima.info/index.php/area/evidenceSynthesisDatabase

Cakranegara, P.A., Hendrayani, E., Jokhu, J.R. & Yusuf, M. (2022). Positioning women entrepreneurs in small and medium enterprises in Indonesia–the food and beverage sector. *Enrichment: Journal of Management* 12(5): 3873–3881.

Cirillo, V., Evangelista, R., Guarascio, D. & Sostero, M. (2021). Digitalization, routineness and employment: An exploration of Italian task-based data. *Research Policy*, 50(7), 104079.

Clausen, T.H. (2020). The liability of rurality and new venture viability. *Journal of Rural Studies,* 73, 114–121. doi: 10.1016/j.jrurstud.2019.12.005

De Moraes Silva, D.R., Vonortas, N.S. & Furtado, A.T. (2022). Innovation barriers, indicators and policies: Coevolving concepts in the history of innovation studies. *Annals of Science and Technology Policy*, 6(2), 100-227. https://doi.org/10.1561/110.00000021

Distanont, A. & Khongmalai, O (2020). The role of innovation in creating a competitive advantage. *Kasetsart J. Soc. Sci*, 41, 15–21.

Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: how digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technol. Forecast. Soc. Change*. DOI: 10.1016/j.techfore.2019.119791.

Epede, M.B. & Wang, D. (2022). Global value chain linkages: An integrative review of the opportunities and challenges for SMEs in developing countries. *International Business Review*, 31(5), 101993. https://doi.org/10.1016/j.ibusrev.2022.101993

Erhan, T., Uzunbacak, H.H. & Aydin, E. (2022). From conventional to digital leadership: Exploring digitalization of leadership and innovative work behavior. *Management Research Review*, *45*(11), 1524–1543. https://doi.org/10.1108/MRR-05-2021-0338

Etemad, H. (2020). Managing uncertain consequences of a global crisis: SMEs encountering adversities, losses, and new opportunities. *Journal of International Entrepreneurship,* 18(2), 125-144. https://doi.org/10.1007/s10843-020-00279-z

Fan, D., Breslin, D. Callahan, J.L., Iszatt-White, M. (2022). Advancing literature review methodology through rigour generativity scope and transparency. *International Journal of Management Reviews,* 24: 171–180. https://doi.org/101111/ijmr12291

Fernandes, A.J., Ferreira, J.J. (2022). Entrepreneurial ecosystems and networks: a literature review and research agenda. *Rev Manag Sci,* 16:189 247. https://doi.org/10.1007/s11846-020-00437-6

Fritsch, M., Pylak, K. & Wyrwich, M. (2022). Historical roots of entrepreneurship in different regional contexts – The case of Poland. *Small Business Economics*, 59(1), 397-412. https://doi.org/10.1007/s11187-021-00535-z

Sharma, G.P., Kraus, S., Liguori, E., Bamel, U.K. & Chopra, R. (2022). Entrepreneurial challenges of COVID-19: Re-thinking entrepreneurship after the crisis. *Journal of Small Business Management*, DOI: 10.1080/00472778.2022.2089676

Halberstadt, J., Niemand, T., Kraus, S., Rexhepi, G., Jones, P. & Kailer, N. (2021). Social entrepreneurship orientation: Drivers of success for start-ups and established industrial firms. *Industrial Marketing Management*, 94, 137-146. Retrieved from: https://cronfa.swan.ac.uk/Record/cronfa54666 (accessed on 11 December 2021).

Hameed, W.U., Nisar, Q.A. & Wu, H.C. (2021). Relationships between external knowledge, internal innovation, firms' open innovation performance, service innovation, and business performance in the Pakistani hotel industry. *International Journal of Hospitality Management*, 92, 102745. https://doi.org/10.1016/j.ijhm.2020.102745

Hang, C.C. & Chen, J. (2021). Innovation management research in the context of developing countries: analyzing the disruptive innovation framework. *Int. J. Innov. Stud.*, 5(4), 145e147

He, F., Ma, Y., & Zhang, X. (2020). How does economic policy uncertainty affect corporate innovation? – Evidence from China-listed companies. *International Review of Economics and Finance* 67, 225-239. https://doi.org/101016/jiref202001006

Herve, A., Schmitt, C. & Baldegger, R. (2020). Digitalization, entrepreneurial orientation, and internationalization of micro-, small- and medium-sized enterprises. *Technol. Innov. Manag. Rev.* 10, 5–17. doi: 10.22215/timrevie w/1343

International Labour Organization (2024). World Employment and Social Outlook tends 2024. Retrieved from https://wwwiloorg/resource/news/global-unemployment-rate-set-increase-2024-while-growing-social

Ismail, I.J. (2022). Entrepreneurial Start-up Motivations and Growth of Small and Medium Enterprises in Tanzania: The Role of Entrepreneur's Personality Traits. *FIIB Business Review*, 11(1), 79–93. https://doi. org/10.1177/23197145211068599

Katila, R., Piezunka, H., Reineke, P. & Eisenhardt, K.M. (2022). Big fish versus big pond? Entrepreneurs established firms and antecedents of tie formation. *Academy of Management Journal* ,65(2), 427-452.

Kearney, C. (2022). *Leading innovation and entrepreneurship in healthcare: A global perspective*. Edward Elgar.

Kennard, M. (2021). *Innovation and Entrepreneurship*. Routledge, 2021.

Khan, R.U., Salamzadeh, Y., Shah, S.Z. & Hussain, M. (2021). Factors affecting women entrepreneurs' success: a study of small- and medium-sized enterprises in emerging market of Pakistan. *Journal of Innovation and Entrepreneurship*, 10(11), 1-21. Retrieved from: https://doi.org/10.1186/s13731-021-00145-9

Kiani, A., Yang, D., Ghani, U. & Hughes, M. (2022). Entrepreneurial passion and technological innovation: The mediating effect of entrepreneurial orientation. *Technology Analysis and Strategic Management*, 34(10), 1139-1152. https://doi.org/10.1080/09537325.2021.1948986

Klein, L.L., Junior, N.B. & Faccin, K. (2022). Innovation in networks of companies with different governance structures. *International Journal of Business Excellence* 27(1), 125-146. https://doi.org/101504/ijbex2022123034

Kruesi, M.A., Bazelmans, L. (2023). Resources, capabilities and competencies: a review of empirical hospitality and tourism research founded on the resource-based view of the firm. *J. Hosp. Tour. Insights,* 6 (2), 549–574

Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Morales Reyes, C.A., Prochotta, A., Steinbrink, K.M. & Berger, E.S.C (2020). Start-ups in times of crisis—A rapid response to the COVID-19 pandemic. *J Bus Ventur Insights* 13, e00169. https://doi.org/10.1016/j.jbvi.2020.e00169

Kuratko, D.F., Fisher, G. & Audretsch, D.B. (2021a). Unravelling the entrepreneurial mindset. *Small Business Economics*, *57*, 1681-1691.

Kuratko, D.F., Hornsby, J.S. & McKelvie, A. (2021b). Entrepreneurial mindset in corporate entrepreneurship: Forms, impediments, and actions for research. *Journal of Small Business Management*, 1-23.

Kurniati, P.S. & Suryanto, S. (2023). Digital entrepreneurship strategy in the tourism business of the tourism 4.0 era. *Journal of Eastern European and Central Asian Research,* 10 (6), 819- 828 DOI: http://dx.doi.org/10.15549/jeecar.v10i6.150

Kutcher, A.M., LeBaron, V.T. (2022). A simple guide for completing an integrative review using an example article. *Journal of Professional Nursing,* 40(2022), 13-19 https://doi.org/101016/jprofnurs202202004

Lin, L., Shadiev, R., Hwang, W.Y. & Shen, S.S. (2020). From knowledge and skills to digital works: an application of design thinking in the information technology course. *Think. Skills Creat.* 36, 100646. doi: 10.1016/j. tsc.2020.100646

Liu, Y., Dilanchiev, A., Xu, K. & Hajiyeva, A.M. (2022). Financing SMEs and business development as new post-COVID-19 economic recovery determinants. *Economic Analysis and Policy*, 76, 554-567. https://doi.org/10.1016/j.eap.2022.09.006

Li-Ying, J. & Nell, P. (2020). Navigating opportunities for innovation and entrepreneurship under COVID-19. Insight Frontier. Retrieved from chromeextension://efaidnbmnnnibpcajpcglclefindmkaj/https://cmr.berkeley.edu/assets/documents/pdf/2020-06-innovation-entrepreneurship.pdf

Lopes, J., Oliveira, M., Silveira, P., Farinha, L., Oliveira, J. (2021). Business Dynamism and Innovation Capacity, an Entrepreneurship Worldwide Perspective. J. *Open Innov. Technol. Mark. Complex.* 7, 94.

Makiwa, P.J., & Steyn, A.A. (2020). A framework for stimulating adoption of ICT in SMEs in developing countries: The case of Zimbabwe. *African Journal of Gender, Society and Development (Formerly Journal of Gender, Information and Development in Africa),* 9(3), 137–158. https://doi.org/10.31920/2634-3622/2020/9n3a6

Martinez-Chafer, L., Molina-Morales, F.X. & Roig-Tierno, N. (2023). Explaining technological innovation of the clustered firms: Internal and relational factors. *Journal of Small Business Management* 61(4), 1929-1960.

Meyer, K.E., Prashantham, S. & Xu, S. (2021). Entrepreneurship and the Post-COVID-19 Recovery in Emerging Economies. *Management and Organization Review* 17,5, December 2021, 1101–1118 doi: 10.1017/mor.2021.49

Mohamad, A., Mohd Rizal, A., Kamarudin, S. & Sahimi, M. (2022). Exploring the co-creation of small and medium enterprises and service providers enabled by digital interactive platforms for

internationalization: A case study in Malaysia. *Sustainability*, 14(23), 16119. https://doi.org/10.3390/su142316119

Molina-Garcia, A., Dieguez- Soto, J., Galache-Laza, M.T. & Campos-Valenzuela, M. (2023). Financial literacy in SMEs: A bibliometric analysis and a systematic literature review of an emerging research field. *Review of Managerial Science*, 17(3), 787-826. https://doi.org/10.1007/s11846-022-00556-2

Nawawi, M.N., Samsudin, H., Saputra, J., Szczepańska- Woszczyna, K. & Kot, S. (2022). The effect of formal and informal regulations on industrial effluents and firm compliance behavior in Malaysia. *Production Engineering Archives*, 28(2), 193-200. https://doi.org/10.30657/pea.2022.28.23

Oberländer, M., Beinicke, A. & Bipp, T. (2020). Digital competencies: A review of the literature and applications in the workplace. *Computers and Education*, 146, 103752. https://doi.org/10.1016/j.compedu.2019.103752

Orobia, L.A., Tusiime, I., Mwesigwa, R. & Ssekiziyivu, B (2020). Entrepreneurial framework conditions and business sustainability among the youth and women entrepreneurs. *Asia Pacific Journal of Innovation and Entrepreneurship*, 14(1), 60–75. https://doi.org/10. 1108/APJIE-07-2019-0059

Page, A. & Holmström, J. (2023). Enablers and inhibitors of digital startup evolution: A multi-case study of Swedish business incubations. *Journal of Innovation and Entrepreneurship* 12(35). https://doi.org/101186/s13731-023-00306-y

Papadopoulos, T., Baltas, K.N. & Balta, M.E. (2020). The use of digital technologies by small and medium enterprises during COVID-19: Implications for theory and practice. *International Journal of Information Management*, 55, 102192. https://doi.org/10.1016/j. ijinfomgt.2020.102192

Pindado, E., Sánchez, M. & Martínez, M.G. (2023). Entrepreneurial innovativeness: When too little or too much agglomeration hurts. *Research Policy*, 52(1), 104625.

Ratten, V. & Usmanji, P. (2020). Entrepreneurship education: time for a change in research direction? *International Journal of Management Education*, 19, 1-8. https://doi.org/10.1016/j.ijme.2020.100367

Ruiz-Jiménez, J.M., Ruiz-Arroyo, M. & del Mar Fuentes-Fuentes, M. (2021). The impact of effectuation, causation, and resources on new venture performance: novice versus expert entrepreneurs. *Small Business Economics*, 57, 1761-1781.

Sampene, A.K., Li, C., Wiredu. J., Agyeman, F.O. & Brenya, R. (2023). Examining the nexus between social cognition, biospheric values, moral norms, corporate environmental responsibility and pro-environmental behaviour Does environmental knowledge matter? *Curr Psychol* 43, 6549–6569. https://doi.org/10.1007/s12144-023-04832-6

Schmitz, A., Urbano, D., Dandolini, G.A., de Souza J.A., Guerrero, M. (2017). Innovation and entrepreneurship in the academic setting: a systematic literature review. *Int Entrepreneurship Manag J*. 13(2), 369–395. doi:10.1007/s11365-016-0401-z

Setini, M., Yasa, N.N.K., Gede Supartha, I.W., Ketut Giantari, I.G.A. & Rajiani, I. (2020). The passway of women entrepreneurship: Starting from social capital with open innovation, through to knowledge sharing and innovative performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(2), 25. https://doi.org/10.3390/joitmc6020025

Shadiev, R., Wang, X., Liu, T.Y. & Yang, M. (2022). Improving students' creativity in familiar versus unfamiliar mobile-assisted language learning environments. *Interact. Learn. Environ*. doi: 10.1080/10494820.2021. 2023891

Śledzik, K. (2013). Schumpeter's View on Innovation and Entrepreneurship (April 29, 2013). Management Trends in Theory and Practice, (ed.). Stefan Hittmar, Faculty of Management Science and Informatics, University of Zilina and Institute of Management by University of Zilina, 2013, ISBN 978-80-554-0736-4. Retrieved from SSRN: https://ssrn.com/abstract=2257783 or http://dx.doi.org/10.2139/ssrn.2257783

Smallbone, D., Saridakis, G. & Abubakar, Y.A. (2022). Internationalisation as a stimulus for SME innovation in developing economies: Comparing SMEs in factor-driven and efficiency-driven economies. *Journal of Business Research*, 144, 1305-1319. https://doi.org/10.1016/j.jbusres.2022.01.045

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research 104 (2019),* 333-339 https://doi.org/101016/jjbusres201907039

Supplementary, File (2025). Challenges of Innovative Entrepreneurship in a Technological Era: An Integrative Review. figshare. Dataset. https://doi.org/10.6084/m9.figshare.29250794.v1

Steiber, A., Alänge, S. & Corvello, V. (2020). Learning with start-ups: an empirically grounded typology. *Learn Organ,* 28(2),153–166. https://doi.org/10.1108/tlo-04-2020-0061

Stephens, S., McLaughlin, C., McLaughlin, K. (2021). Small business in a time of crisis: a five-stage model of business grief. *J Bus Ventur Insights,* 16, e00282. https://doi.org/10.1016/j.jbvi.2021.e00282

Szczepańska-Woszczyna, K. & Gatnar, S. (2022). Key competences of research and development project managers in high technology sector. *Forum Scientiae Oeconomia*, 10(3), 107- 130. https://doi.org/10.23762/FSO_VOL10_NO3_6

Teirlinck, P. (2022). Enhancing R and D employment slack during environmental turbulence: Triggers and firm performance consequences for R and D-active SMEs. *Technovation* 118. https://doi.org/101016/jtechnovation2022102622

Thukral, E. (2021). COVID-19: Small and medium enterprises challenges and responses with creativity, innovation, and entrepreneurship. *Strategic Change*, 30(2), 153-158. https://doi.org/10.1002/jsc.2399

Torres de Oliveira, R., Gentile-Ludecke, S. & Figueira, S. (2022). Barriers to innovation and innovation performance: The mediating role of external knowledge search in emerging economies. *Small Business Economics*, 58(4), 1953-1974. https://doi.org/10.1007/s11187-021-00491-8

Toxopeus, H., Achterberg, E. & Polzin, F. (2021). How can firms access bank finance for circular business model innovation? *Business Strategy and the Environment,* 30(6), 2773-2795. https://doi.org/101002/bse2893

UNCTAD (2021). *Digital Economy Report 2021*. Geneva. https://unctad.org/webflyer/ digital-economy-report-2021

Urbig, D., Bönte, W., Procher, V.D., Lombardo, S. (2020). Entrepreneurs embrace competition: Evidence from a lab-in-the-field study. *Small Bus. Econ*, 55, 193–214.

Venkatachalam, S., Marshall, A., Ojiako, U. & Chanshi, C.S. (2019). Organisational learning in small and medium-sized South African energy project organisations. *Management Research Review*, *43*(5), 595–623.

Wang, Z., Li, M., Lu, J. & Cheng, X. (2022). Business Innovation based on artificial intelligence and Blockchain technology. *Information Processing and Management*, 59(1), 102759.

Wardana, L.W., Narmaditya, B.S., Wibowo, A., Mahendra, A.M., Wibowo, N.A., Harwida, G. & Rohman, A.N. (2020). The impact of entrepreneurship education and students' entrepreneurial mindset: The mediating role of attitude and self-efficacy. *Heliyon*, 6(9).

Youssef, A.B., Boubaker, S., Dedaj, B. & Carabregu-Vokshi, M. (2021). Digitalization of the economy and entrepreneurship intention. *Technol. Forecast. Soc. Change*, 164, 120043.

Zhou, J., Yang, J., Sun, H.H., Liu, Y. & Liu, X. (2021). The influence of entrepreneurial cognition on business model innovation: a hybrid method based on multiple regressions and machine learning. *Front. Psychol.* 12, 744237. doi: 10.3389/fpsyg.2021.744237

Ziemnowicz, C. (2013). Joseph A. Schumpeter and Innovation. In: Carayannis, E.G. (eds) Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-3858-8_476

BRIEF DESCRIPTION OF AUTHOR/AUTHORS:

Fitong Ketchiwou Gaelle (Doctor)
ORCID ID: https://orcid.org/0000-0003-1793-2560

Affiliation: School of Interdisciplinary Research and Graduate Studies, College of Graduate Studies, University of South Africa, Preller St, Muckleneuk, Pretoria, 0002, South Africa, www.unisa.ac.za
Email: gaellefit@gmail.com
Gaelle Fitong Ketchiwou holds a Doctorate. Her research interests include human resource development, women, and the Fourth Industrial Revolution, which have resulted in several publications in peer-reviewed journals.

Ngulube Patrick (Professor).
ORCID ID: https://orcid.org/0000-0002-7676-3931
Affiliation: School of Interdisciplinary Research and Graduate Studies, College of Graduate Studies, University of South Africa, Preller St, Muckleneuk, Pretoria, 0002, South Africa, www.unisa.ac.za
Email: Ngulup@unisa.ac.za
Patrick Ngulube (PhD) is a professor of information science and interdisciplinary research at the University of South Africa. His research interests are in records and archives, e-government, application of information and communication technologies, research methods, and knowledge management, including indigenous knowledge systems.