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Entrepreneurship processes: Digital self-efficacy, technostress, and entrepreneurial behaviour in South Africa

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ABSTRACT

Research identifies digitalisation as the *'holy grail'* of entrepreneurship. But the interplay of digital self-efficacy, technostress, and entrepreneurial behaviour in a non-Western setup is unsubstantiated. Using a digital technology-technostress-entrepreneurial intention interface, we examine multiple relationships influencing early-stage South African entrepreneurs. Regression results derived from 643 of these entrepreneurs confirm that digital self-efficacy impacts the link between perceived behavioural control and technostress. Entrepreneurial passion and the benefits of digital technology amplify this effect. Similarly, digital self-efficacy affects perceived behavioural control and technostress. However, the link between technostress and entrepreneurial passion is weak. Test results on the impact of technostress on entrepreneurial intention are inconclusive. Thus, the originality of these observations lies in revealing how ambivalence towards technology differentially influences the various relationships of digital self-efficacy, technostress, and entrepreneurial behavior in a non-Western context. This ambivalent effect at the intersection of digital technology, technostress, and entrepreneurial intention has socio-economic and policy implications.

1. Introduction

The concept of planned behaviour has been extensively used in organisational behaviour studies (Biswas et al., 2017; Dawkins & Frass, 2005), psychology (Ajzen, 1991, 2002), and entrepreneurship research (Krueger & Carsrud, 1993; Nkwei et al., 2023). In much of this scholarship, its use has substantially enhanced our understanding of human social relations. Based on its ability to enhance understanding of human social relations, its popularity in entrepreneurship research has increased exponentially (Krueger et al., 2000; Roy et al., 2017; Srivastava et al., 2024; Tornikoski & Maalaoui, 2019). Within this stream of research, the concept of planned behaviour is increasingly utilised to explain how perceptions of desirability and feasibility influence entrepreneurial intention (Kautonen et al., 2015; Loi et al., 2024). However, while this scholarship has successfully provided insights into how aspiring entrepreneurs who can control their behaviour are highly likely to launch a new venture, digital technology has introduced a new conundrum for scholarly research. Particularly, its advent has meant additional scholarly work on whether perceived behavioural control, personal attitude, and subjective norms are the sole predictors of entrepreneurial intention in early-stage entrepreneurship, especially in a non-Western context.

Against this backdrop, this study focuses attention on early-stage entrepreneurs in South Africa—a non-Western context. It develops theoretical explanations and perspectives at the digital technology-technostress-entrepreneurial intention interface (cf., Simba et al., 2025). Drawing upon this grounded phenomenon-theory interface, our new theoretical interpretations and explanations advance the understanding of the relationship between people and technology. Prior research suggests that digital self-efficacy is the most critical factor that determines how entrepreneurs use digital technology platforms (Eastin & LaRose, 2000; Janssen et al., 2013; Ulfert-Blank & Schmidt, 2022; Venkatesh & Bala, 2008). Although research identifies African entrepreneurs as competent ICT platform users (see Ajide & Osinubi, 2023; Asongu, Nwachukwu, & Aziz, 2018), recent studies note a lack of guidance on using such platforms in a safe way as a serious risk to these entrepreneurs' physical and mental wellbeing (Simba et al., 2025; Thurik et al., 2024). Lacking guidance on the effects of excessive

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technology consumption has been identified as one of the leading causes of technology-driven health and psychology problems, including anxiety, frustration, depression, and stress (Al Lily et al., 2020; Chaturvedi et al., 2021) conceptualised in the literature as technostress (Ayyagari et al., 2011; Simba et al., 2024).

Considering the centrality of entrepreneurship in the livelihoods of many African families (Weber et al., 2022), which is often complicated by the fuzzy boundaries blurring reasonable and excessive digital technology consumption (Simba et al., 2025), entrepreneurship scholars must prioritise studies that focus attention on the digital technology-technostress-entrepreneurial intention interface (also see D'Angelo et al., 2024). Recent studies have relied mainly on the crisis caused by COVID-19 disruptions to elaborate on how digitalisation became a strategic choice that enabled entrepreneurial resilience among small firms facing abrupt operational disturbances (Gupta & Kumar Singh, 2023; Varma & Dutta, 2023). However, and notwithstanding the essence of this scholarly work, research on the relationships underlying the configurations of the mechanisms at the digital technology-technostress-entrepreneurial intention interface, particularly in South African entrepreneurship, lag behind. Accordingly, the following question guides this inquiry. *How does the conceptual overlap between digital self-efficacy, technostress, and entrepreneurial intention antecedents relate to early-stage entrepreneurship processes in a non-Western context?*

Using a novel digital technology-technostress-entrepreneurial intention theoretical interface to investigate human social relations and behaviour in a non-Western setup underscores the originality of this study. A growing body of scholarly work hints at how non-Western contexts enrich research by revealing unique and rich insights that scholars who rely on over-utilised settings or universal models would otherwise miss out on (Newbert et al., 2022; Simba, 2024; Wickert et al., 2024). Arguably, what makes South Africa a unique research setting is its complex legacies of apartheid. Also, and in addition to perpetuating digital self-efficacy discrimination along socio-economic status, family background, and education (Nyahodza & Higgs, 2017; Reddick et al., 2020), the remnants of apartheid continue to widen the inequalities gap causing uneven access to digital infrastructure and information technology resources needed to effectively apply and use technology (Bornman, 2016; Faloye et al., 2020). Against this backdrop, our focus on the potential of digital self-efficacy among aspiring entrepreneurs originating from South African higher education institutions responds to research calls for contextualising theory building in research (Simba, 2024). It meaningfully advances the field of entrepreneurship in various ways.

First, the results of this study contribute new theorisations of human social relations and behaviour derived at the nexus of digital self-efficacy (Bachmann et al., 2024), technostress (Ayyagari et al., 2011), and entrepreneurial intention (Nascimento et al., 2023). In some way, the study contributes new knowledge that advances understanding of early-stage entrepreneurship processes in a non-Western setup by showcasing how digital self-efficacy affects a perceived behavioural control-technostress link with entrepreneurial passion and the benefits of digital technology amplifying this effect. Crucially, this conceptualization extends the concept of entrepreneurial intention to account for how digital self-efficacy influences the perceived behavioural control-technostress link. Furthermore, we contribute knowledge showing how technostress is negatively associated with entrepreneurial passion and tests on its association with entrepreneurial intention, showing inconclusive results. Thus, the originality of this research article lies in how it elaborates the way technology ambivalence conditions variously influence multiple relationships of digital self-efficacy, technostress, and entrepreneurial behaviour in a non-Western setup.

Second, our theoretical perspectives, denoting the intricate interplay of digital self-efficacy, technostress, and entrepreneurial intention in a rarely studied setting, contribute contextual insights. Considering that the rules of entrepreneurship 'change dramatically from one time and place to another' (Baumol, 1990, p. 898), our digital technology-technostress-entrepreneurial intention analysis goes beyond the averages to increase the value of its inferences due to their contextual embeddedness (Bruton et al., 2022; Newbert et al., 2022; Simba, 2024). Such context-specific insights contribute to entrepreneurship research through their indigenous theorisations of digital self-efficacy, technostress, and entrepreneurial intention antecedents in early-stage entrepreneurship. This contributes knowledge about how entrepreneurial actions and behaviour unfold in a non-Western context.

Third, the ambivalent effect of a digital technology-technostress-entrepreneurial intention interface holds socio-economic, and policy implications for African entrepreneurship. Presenting this interface as a factor in the process of developing entrepreneurial intentions among early-stage entrepreneurs in Africa provides opportunities for future research to assess its replicability in different non-Western settings. Crucially, contextualised theoretical perspectives on how digital self-efficacy, technostress, and entrepreneurial intention antecedents conceptual overlap relate to early-stage entrepreneurship encourages social and policy reforms that mandate support for early-stage entrepreneurs.

2. Theoretical rationale

The notion of planned behaviour originates in social psychology research (Ajzen, 1991) where it has been used to frame human social relations and behaviour (Godin & Kok, 1996). Because of its ability to elaborate how an individual's intentions are intertwined with their conscious commitment or decision to adopt certain behaviour, it has been widely adopted in entrepreneurship research to study entrepreneurial tendencies (Kautonen et al., 2013; Nkwei et al., 2023). While it has provided theoretical headways in defining individual factors that shape decision-making in entrepreneurship, little has been done to advance knowledge about the multiple relationships involving digital technology, technostress, and entrepreneurial behaviour from a developing world perspective (see Simba et al., 2025). Arguably, with the advent of digital technology and its widespread use across many global regions (D'Angelo et al., 2024; Elia et al., 2016; Youssef et al., 2020), its influence on entrepreneurial intention and human social behaviour must be a research priority (cf., Simba et al., 2025; Thurik et al., 2024).

Scholarly research elsewhere associates technology acceptance with one's decision to embrace digitalisation in a way that supports his/her entrepreneurship endeavours. Research that has focused on the determinants of efficacy of modern technologies (e.g., Venkatesh et al., 2003) identifies two essential drivers of technology acceptance. They relate to its perceived helpfulness and perceived ease of use (Davis, 1989; Kamel, 2025). However, and although the ideas of technology acceptance provide useful heuristics essential to decipher the decision processes of entrepreneurs about their adoption of specific technologies in their entrepreneurial pursuits, it is hard to ignore the essence of digital self-efficacy of the users of technology. Therefore, to engender a more nuanced account of the interplay of digital self-efficacy, technology stress, and entrepreneurial action, particularly within the African context, issues of technology adoption and entrepreneurship must be a research priority.

3. Hypotheses development

The hypotheses thereafter are grounded in our theoretical arguments developed through our critical analysis and evaluation of the extant literature. Specifically, our theoretical reasoning, explanations, and perspectives derive from predictions of the human relationship paradigms involving digital technology, digital self-efficacy, perceived behaviour control, entrepreneurial passion, behaviour and intention in early-stage South African entrepreneurship. These predictions and our reasoning underlie our empirical tests thereafter (cf., Sparrowe & Mayer, 2011).

3.1. Entrepreneurial intention

The concept of entrepreneurial intention denotes an entrepreneur's commitment to start a business (Krueger & Carsrud, 1993; Youssef et al., 2020). In its precise form entrepreneurial intention constitutes 'a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future' (Thompson, 2009, p. 676). Yet, despite this definitional clarity, the persistent chasm between such intent and the pursuit of entrepreneurial behaviour requires further investigations to understand the configurations of the antecedents of entrepreneurial intention and their underlying mechanisms, especially in varied entrepreneurial contexts. Indeed, because in such context, engaging in entrepreneurship relies on multiple factors including, but not limited to passion, personal confidence, preparedness, resources, motivation, and the ability to setup a new venture in constrained conditions (Cardon et al., 2005; Hayward et al., 2010). Therefore, an in-depth understanding of the antecedents of entrepreneurial intention in such contexts can enrich entrepreneurship by pinpointing context-specific entrepreneurial behaviour and psychosocial conditions (Simba, 2024).

3.2. Perceived behavioural control

Perceived behavioural control is described as a catalyst that positively influences one's intention to behave in a particular way (Vamvaka et al., 2020). In some ways, it can boost an entrepreneur's confidence in their capability to draw upon entrepreneurial behaviour (Ajzen, 1991) akin to establishing a new venture. Existing scholarly research on entrepreneurial intentions decomposes and appreciates the complexity of perceived behavioural control, disaggregating it into self-efficacy and perceived controllability (Armitage & Conner, 2001; Kraft et al., 2005). This scholarship associates self-efficacy with internal control mechanisms such as one's knowledge base and skills set suggesting that they shape one' perception of the extent of ease or complexity of a specific behaviour (Schjoedt & Shaver, 2012). With regards to controllability, prior studies describe perceived controllability in the context of external control factors, including resources, opportunities, and potential barriers (Azjen, 2002; Elie-Dit-Cosaque et al., 2011). The emphasis within this stream of research is on the idea that identifying and acquiring a behaviour is within one's control (Vamvaka et al., 2020). This characterisation of perceived behaviour control has two implications in terms of shaping one's intention to engage in some form of action. Notwithstanding that a confident entrepreneur may believe their behaviour is entrepreneurial, it is possible that they may overestimate their capacity to draw upon this behaviour when their skills set is incongruent with the task at hand (Vamvaka et al., 2020). Similarly, he or she may feel committed to become an entrepreneur, but lack of essential resources or the presence of barriers associated with a new venture, can constrain their capacity to deploy those behaviours they consider entrepreneurial. To that end we theorise that.

H1. *Perceived behavioural control effects the entrepreneurial intentions of early-stage entrepreneurs.*

3.3. Digital self-efficacy and perceived behavioural control

Research suggests that the advent of digital technology including, but not limited to digital platforms, mobile telephony, and digital applications is transforming and redefining entrepreneurship as a process (Bryniolfsson & McAfee, 2014; World Bank, 2016; Youssef et al., 2020). Against this backdrop, it is possible that the effects of perceived behavioural control on entrepreneurial intent can be simultaneously influenced by digital self-efficacy and technostress. Perceived behavioural control is a function of prior entrepreneurial behaviour and work experiences (Liguori, Bendickson, & McDowell, 2017), including expertise gained from education-based training (Tran & Von Korflesch, 2016). From that perspective, early-stage entrepreneurs capable of using digital technology would feel confident to adopt and use it for their entrepreneurial endeavours compared to those with limited knowledge and expertise (Azjen, 1991). Indeed, early-stage entrepreneurs with high digital self-efficacy are highly likely to have high entrepreneurial tendencies compared with others. In this context, we contend that digital self-efficacy influences the perceived behaviour control-entrepreneurial intention link. Moreover, for early-stage entrepreneurs with a high level of digital self-efficacy, their internal locus of control will have a significant impact on intention to engage in entrepreneurship (Hsia et al., 2014). Against that backdrop, we hypothesize that.

H2. *Perceived behavioural control effects the digital self-efficacy of early-stage entrepreneurs.*

3.4. Perceived behaviour control and technostress

Technology-driven initiatives have increased exponentially across many business sectors (Nascimento et al., 2024). This notable wide technology adoption trend has also brought its challenges, including excessive consumption of technology, anxiety, frustration, depression, and stress (Chaturvedi et al., 2021). These technology-driven health issues are defined in the literature using the terms technostress (Ayyagari et al., 2011). Research suggests that one of the manifestations of technostress, include techno-overload largely caused by extended exposure to technology (Thurik et al., 2024). Such exposure has been identified as the main factor causing severe psychology and health issues in entrepreneurship (Simba et al., 2025).

The effects of technostress are heightened when those who use ICT perceive environmental demands to exceed their capabilities (Bravo-Adasme & Alejandro Cataldo, 2022). Indeed, recent research (e.g., Simba et al., 2024; Thurik et al., 2024) identified poor health and wellbeing were identified as the outcomes of excessively consuming technology. Thus, in scenarios where early-stage entrepreneurs feel overwhelmed and overburdened by using technology, their perceived behaviour control can have an inconsequential effect on their entrepreneurial intentions. In a way, their capacity to convert their self-efficacy into entrepreneurial activity is severely impacted. Prior studies recognize that entrepreneurial passion can motivate entrepreneurial individuals to remain resolute when confronted with persistent hurdles (Bignetti et al., 2021; Cardon et al., 2009). Therefore, early-stage entrepreneurs who are passionate about entrepreneurship can channel their passion towards dealing with adverse and destructive consequences arising from the use of technology. From that perspective, passion can be harnessed as a strategy for realising high levels of performance and overcoming barriers in a business environment (Ferreira-Neto et al., 2023). Thus, in technology-saturated contexts, passion can be exploited to address techno-overload, complexity, dependence, and invasion that often accompanies excessive technology consumption. From that perspective, we contend that.

H3. *Perceived behavioural control impacts technostress among early-stage entrepreneurs*

Technology-induced entrepreneurial behaviour denote those actions and preparations that entrepreneurs take to acquire the know-how, experience, and knowledge to start a technology venture (Ip, 2024). It is, therefore, reasonable to expect early-stage entrepreneurs to capitalise on the benefits of technology to create entrepreneurship opportunities. Arguably, digitalisation presents multiple benefits, including but not limited to transactional costs, economies of scale, and reduced information asymmetries, etc. (Gieure et al., 2020; Jin & Hurd, 2018). Digitally literate early-stage entrepreneurs can use it to create entrepreneurial opportunities (Marikyan & Papagiannidis, 2023). Thus, early-stage entrepreneurs who have digital technology skills will likely boost their intentions to engage in entrepreneurship (Suryani & Chaniago, 2023). Consistent with that, we theorise that.

H4. *The benefits of digital technology influence early-stage entrepreneurs' intention to engage in entrepreneurship.*

3.5. Technology and its application in entrepreneurship

Using technology for business has been credited with multiple benefits spanning the transformation of business strategies, advancement of social innovations and promotion of borderless marketing, enabled by the easiness and security of conducting digital business ventures and transactions unfettered by time restrictions (Morino, 2018; Shaqiri, 2015; Suparno et al., 2020). Even though digital technologies have been advanced as a stimulant of technological innovations to foster increased employment opportunities for youth and bridge the gender gap (Chikwakwa, 2022), it remains unclear whether these technology benefits lead to digital self-efficacy especially in contexts marked by the digital divide. The availability of technology and its espoused benefits does not necessarily translate into meaningful and agentive capacity to deploy these technologies (digital self-efficacy), when students feel underprepared to effectively use such technologies. However, research has alluded to students' meaningful capacity to use technology for academic and future purposes (e.g. entrepreneurial pursuits) when they perceive certain benefits of using technology (Modise & Rambe, 2024). By extension, Zhang (2022) affirms a positive and significant relationship between students' self-efficacy and their educational use of technology in the classroom. Consistent with this narrative, we contend that.

H5. *The benefits of digital technology influence the digital self-efficacy of early-stage entrepreneurs*

3.6. Digital self-efficacy in entrepreneurship

Despite the growing body of research (Duong et al., 2024; Sutiadiningsih et al., 2025; Vu et al., 2024) that identifies self-efficacy as a key driver of the entrepreneurial processes, especially entrepreneurial intentions, the contribution of digital literacy to entrepreneurial behaviours remains underexplored. For instance, even though Duong et al. (2024) identify self-efficacy as a key contributor to the advancement of digital entrepreneurship, and the literature has emphasised the importance of understanding cognitive processes that propel entrepreneurial endeavours within the digital domain (Elnadi & Gheith, 2023), whether digital self-efficacy is one such factor remains an open question. While the growth of entrepreneurial intentions has been attributed to possession of entrepreneurial self-efficacy, digital competency has also been included as a predictor of entrepreneurial intention (Sutiadinningsih et al., 2025). Following this logic, we hypothesize that.

H6. *Digital self-efficacy influences the formation of entrepreneurial intention among early-stage entrepreneurs.*

It is undisputed that more early-stage entrepreneurs have become more dependent on digital technologies such as learning management systems and social media platforms in the 'new normal' imposed by the post-pandemic era. With the elimination of contact classes due to risk-adjusted lockdowns and social distancing in South Africa, all online learning and assessments unfolded with the mediation of technology, creating greater anxiety, discomfort, and complexity to students, especially those who were digitally underprepared to fully embrace online learning. Even though research attributes reduced psychological anxiety (i.e., a component of technostress) to the advancements in technology self-efficacy (Lee, 2021), this study was conducted on GenZ customers from non-African contexts. To compound this relational analysis, technostress has been reported to diminish early-stage entrepreneurs' self-efficacy in ways that increase their resistance to innovation (Zhang, 2023) pointing to a reverse relationship. However, pertaining to early-stage entrepreneurs (entrepreneurship students) in an academic context, recent research confirms that when it comes to the relationship between technology self-efficacy and entrepreneurship intention, the mediating effects of technostress are negligible (see Simba et al., 2024). Notwithstanding this contextualised assumption, this study has the following hypothesis.

H7. *Digital self-efficacy has an impact on technostress among early-stage entrepreneurs.*

As more early-stage entrepreneurs are increasingly compelled to interact with digital content and technologies during and in the post pandemic era, it becomes increasingly hard to distinguish between minimal and excessive uses of technology (Simba et al., 2025). Even in contexts where the use of technology was deemed optimal, negative associations were reported between dimensions of technostress such as techno overload and wellbeing outcomes (Chandra et al., 2019; Hang et al., 2022). However, when early-stage entrepreneurs operate in digital environments, their entrepreneurial intentions could be leveraged by opportunities digital technologies create for opportunity identification, online market research, resource mobilization through crowdfunding and the development of digital business models. Even though digital technology presents these multiple benefits for entrepreneurship (Soluk et al., 2021), research has also cautioned that entrepreneurs operating in digital platforms often experience role conflicts and suffer from high level of stress occasioned by digital ecosystems (Nambisan & Baron, 2021). To the extent that high stress levels are associated with entrepreneurial behaviours, we hypothesize that.

H8. *Technostress affects the entrepreneurial intentions of early-stage entrepreneurs.*

3.7. Entrepreneurship passion and technostress

The concept of entrepreneurial passion is a component of affect, which comprises a variety of moods and emotions (Baron, 2008), which vary in their intensity, specificity and duration (Kiani et al., 2022). To the extent that entrepreneurship is a cognitively demanding enterprise involving both intense and low levels of emotions and moods respectively, as nascent entrepreneurs, students may experience positive and negative affect, which invariably affect their entrepreneurial behaviors. Characterised as 'consciously accessible, intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur,' entrepreneurial passion can find expression in the founding of ventures, investing and growth of firms (Cardon et al., 2009). While passionate entrepreneurs have been hailed for their capacity to find new clients, develop new marketplaces, and enhance firm procedures (Kiani et al., 2022; Türk et al., 2020), these activities can be cognitively demanding and emotionally exhausting. As such, entrepreneurship passion has been highlighted as one of the predictors of technostress amongst early-stage entrepreneurs (Simba et al., 2024). Following that logic, we contend that.

H9. *Entrepreneurial passion has an impact on technostress among early-stage entrepreneurs.*

While predictors of entrepreneurial intentions are widely discussed in entrepreneurial literature (Quan, 2012; Raza et al., 2018; Tian et al., 2022), what is missing is an appreciation of the affective and emotional dimensions originating from the entrepreneurs that give impetus, direction and set the trajectory towards such entrepreneurial behaviours (Kiani et al., 2022). The implications of entrepreneurial passion for entrepreneurial success and psychological wellbeing are well documented (Chen, 2022). It is uncontested that entrepreneurial passion has a direct bearing on different entrepreneurial behaviours spanning venture founding, resource mobilization and venture growth. As such, research (Nguyen and Nguyen, 2024) has pinpointed the direct contribution of entrepreneurial passion to the formation of entrepreneurial intention and behaviour, which in turn promote innovation, new jobs, and economic development. Against this backdrop, we conclude that.

H10. Entrepreneurial passion influences the entrepreneurial intentions of early-stage entrepreneurs.

3.8. Conceptual model

Based on our multivariate theorisations advanced through our hypotheses and existing theoretical paradigms of human social behaviour, we devise Fig. 1 to illustrate the connectivity of our independent and dependent variables. The logic behind using our new digital technology-technostress-entrepreneurial intention theoretical interface as a tool for examining the mechanisms underlying the multivariate relationships involving variables in Fig. 1, is consistent with scholars who advocated for using integrated theoretical perspectives to generate novel insights in research (see Sparrowe & Mayer, 2011).

4. Methodology

Considering that this study examines the associative relationships between variables, including the sequence of these relationships (Cohen, Manion, & Morrison, 2011), a quantitative research approach was deemed suitable. Adopting this approach enabled us to apply a digital technology-technostress-entrepreneurial intention interface and fully examine the multivariate human social relations conspiring to influence early-stage African entrepreneurship. This is consistent with research studies elsewhere, including Hayes (2018) who advocated for a pragmatist approach in multivariate studies. Unlike qualitative studies that rely on small sample sizes (Yin, 2003), our expansive sample and the intricate nature of the variables concerning the antecedents of entrepreneurial intentions necessitated a quantitative approach (Field, 2024).

4.1. Research design and settings

South Africa has, on the one hand, one of the most sophisticated digital infrastructure on the African continent. On the other hand, the country presents an excellent exemplar of 'unevenly diffused digital infrastructure' (Chetty, 2023, p. 5). Thus, a cross-sectional survey design in which a representative sample of early-stage entrepreneurs covering a wide demographic, including age, gender, educational levels, disciplines etc. was sampled (Cohen et al., 2011). This 'snapshot' approach was deemed helpful in capturing the nature of relationships among variables at a specific time and was fundamental to our retrospective and prospective inquiry. Adopting a cross-sectional design was essential for this study to test our assumptions on the relationships between the antecedents of entrepreneurial intentions, technostress, and digital self-efficacy in a rarely studied African context. Crucially, this approach helped us to gain broader insights into early-stage entrepreneurs at a particular point in time of an entrepreneurial process (Taris et al., 2021) scripted in a non-Western setup.

Using South Africa as the research setting benefited this research in several ways. It provided the opportunity for utilising a cross-sectional design. According to Universities South Africa, the government department responsible for education mandated South Africa's twenty-six (26) public universities to deliver entrepreneurship education programs and encourage early-stage entrepreneurship across all disciplines. This involved enrolling and introducing compulsory first-year entrepreneurial courses. Crucially, early-stage entrepreneurs were encouraged to undertake entrepreneurship at some point during their university years (University South Africa, 2020). With our cross-sectional parameters set, we used a survey questionnaire to gather data.

4.2. Data collection

The survey was carried out over three months, and data was collected at two data points (at the first and third months). Keeping wave one (1) of data collection close to wave two (2) was intended to

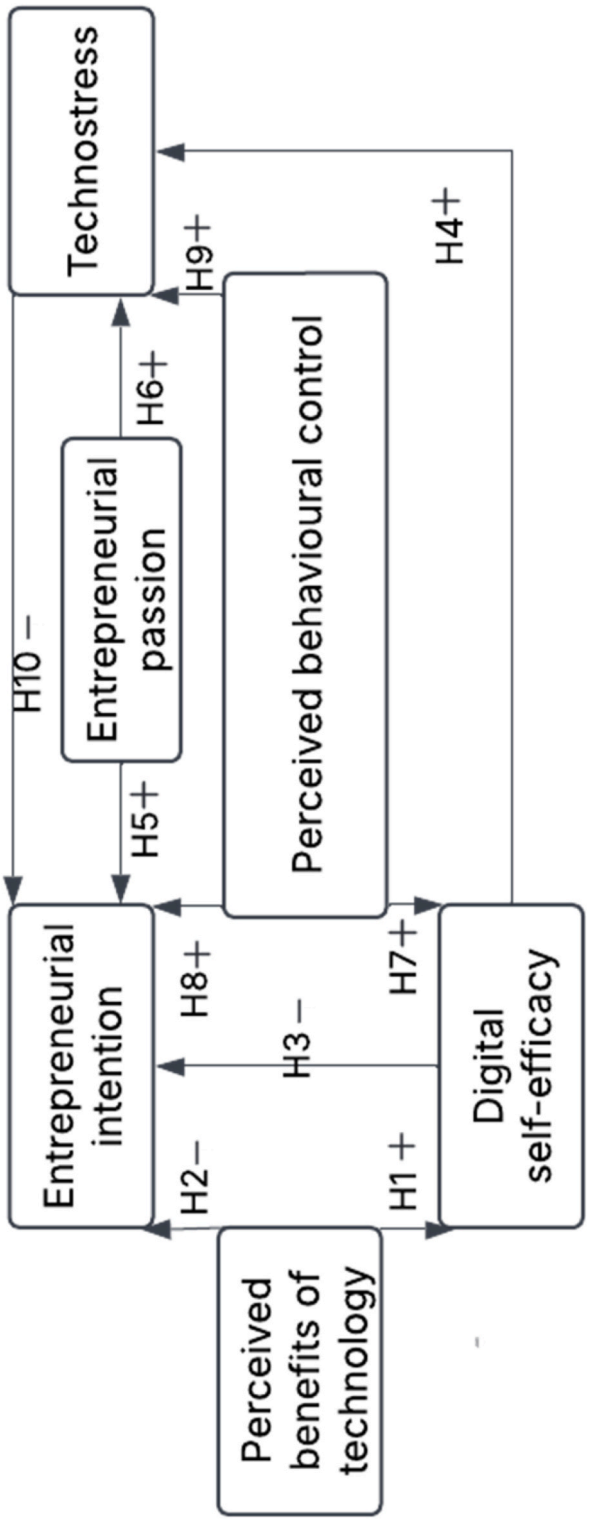

Fig. 1. Conceptual model.

guard against unexpected events, which could alter the level of intentions due to the significant time gap between the antecedents and outcome variables (Duong, 2022). Our approach, which involved respondents providing data at two or more occasions, enabled us to make intra-individual comparisons across time (Taris, 2000). As previously stated, this is important because the rules of entrepreneurship 'change dramatically from one time and place to another' (Baumol, 1990, p. 898). Therefore, our approach enabled us to capture relevant and rich insights because we expected the mindsets of our targeted early-stage entrepreneurs to change as they are exposed to new conditions. We focused on early-stage entrepreneurs who had enrolled in an entrepreneurship program and spent between twelve (12) hours to two (2) years engaged in entrepreneurial activities, including courses, programs, projects, case studies, practical exercises, and enterprise-related simulations. This is consistent with previous studies (e.g., Malebana & Mothibi, 2023; Ndofirepi, 2022) in which the exposure to entrepreneurship education and activities were considered as critical in shaping dispositions towards creating venture creation and business ownership.

4.3. Sample determination

Before carrying out the main study, a pilot study was conducted. This preliminary study served to test the robustness of our research instruments, detect any deficiencies, and identify potential problem areas prior to undertaking a full scale study (Hassan et al., 2006). The pilot study was based on twenty (20) questionnaires involving early-stage entrepreneurs identified in public technical and vocational institutions considered part of public higher education by South Africa's department for higher education. These early-stage entrepreneurs shared many demographic characteristics with those in South Africa's public universities. Minor amendments to text in the questionnaire were implemented and verified by senior academics at the second author's institution.

Considering that the total number of students enrolled in South Africa's public universities in 2023 was not readily available at the time we conducted the survey, the total number of enrollments at these universities for that year was used as a proxy for participation in entrepreneurship in higher education. The Department of Higher Education and Training projected these universities to provide 1,112,439 spaces in January 2023 (South African Government News Agency, 2023). We used a Raosoft sample size calculator to determine the appropriate sample for early-stage entrepreneurs in our target universities who had participated in entrepreneurship activities. When we set it at a significance level of 95 %, a margin of error of 5 %, a sample distribution of 50 %, a total population enrolled at public higher education institutions (HEIs) of 1,112,439 students generated a sample size of 385. To increase the response rate, we doubled the sample size by distributing 700 questionnaires. Considering that Smart PLS requires a minimum sample of 200 respondents, 385 early-stage entrepreneurs were used as our baseline and 700 questionnaires were deemed adequate for data collection and sophisticated analysis. Of the questionnaires distributed, 651 were returned, and 643 questionnaires were found to be useable, representing a response rate of 93 %. Of the retained questionnaires, a sizeable number came from Gauteng (494 = 76.8 %), KwaZulu Natal (83 = 12.9 %), Eastern Cape (20 = 3.1 %), Limpopo (18 = 2.8 %), Mpumalanga (10 = 1.6 %) and Western Cape (9 = 1.4 %). The dominance of Gauteng province was logical since four large universities from the province participated in the survey.

The study combined convenience and purposive sampling. The research assistant helped with data collection by extracting data from early-stage entrepreneurs to whom he had access, and who had participated in at least one entrepreneurial module at any of the 26 public universities in South Africa. Given the variations in the academic levels at which early-stage entrepreneurs enrolled for these modules across institutions, the educational level of study was not considered in the selection criteria. However, as public institutions, all types of academic institutions (traditional universities, comprehensive universities, and universities of technology) in the country, and new universities (a recent phenomenon) were included in the study.

4.4. Operationalisation and measurement of variables

Consistent with the concept of planned behaviour (Ajzen, 1991), entrepreneurial intention was used as the dependent variable for this study. Drawing on this concept, we predicted intention among early-stage entrepreneurs by using the following independent variable: perceived behavioural control (Ajzen, 2012; Malebana & Mothibi, 2023). Scales adapted from the literature were used to measure our independent variables.

Entrepreneurial intention: this variable was measured using a scale adapted from contemporary literature (see Asimakopoulos et al., 2019; Youssef et al., 2020). On a five-point Likert scale, early-stage entrepreneurs rated the extent to which they agreed with the statements they were provided. The scale comprised four items with sample statements including *"I intend to create a firm in the future"* and *"I have thought very seriously of starting a firm at some point"*.

Perceived behavioural control: based on prior research (see Youssef et al., 2020) this variable was measured using six items. The sample items for this concept comprised statements that included *"I am prepared to start a viable firm"* and *"I have some control over the creation process of a new firm"* and *"I know the necessary practical details to start a firm"*.

Entrepreneurial passion: consistent with Feng and Chen (2020), this variable was measured using five items. The sample items for this construct involved statements such as *"entrepreneurship is my passion"* and *"I can devote myself to entrepreneurial activities"*.

Perceived benefits of technology: this variable was measured in line with seven items as presented in existing studies (Perrotta, 2013). The sample items for this concept were *"digital technology presents business opportunities for me"* and *"through digital technology, the systems or processes of the business are made more effective"*.

Digital self-efficacy: following Perrotta (2013) this variable was measured using five items. The sample items for this concept comprised statements such as "I am confident in using digital technology effectively" and "I am confident to deal effectively with unexpected challenges when using digital technology".

Technostress: this construct comprises multiple dimensions drawn from the literature that focused on technology-driven psychology and health issues, including techno-overload, techno-invasion, techno-complexity, and techno-uncertainty (Marchiori et al., 2018; Simba et al., 2025; Thurik et al., 2024). Techno-overload comprised four items. Sample statements for techno-overload were "*My workload has increased with the use of online learning technology"* and "*I am forced to change my study habits to adapt to online learning technology."* Techno-invasion comprised four items and included sample statements such as "*I spend less time with my family because of online learning"* and "*I feel that my personal life is being invaded by online learning."*

Techno-complexity: the concept of techno-complexity comprises five statements. Its sample items included statements such as "*I do not know enough about the online learning technology to study successfully"* and "*I need a long time to understand and use new features of the online learning technology"*. Techno-uncertainty dimension comprised three items. The sample statements included "The technologies used for online learning keep evolving" and "There are always new features to learn on the online learning platforms".

4.5. Data analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 27 and Smart Partial Least Squares (PLS) Structural Equation Modelling (SEM) and Hayes' Process Macro software packages. Smart PLS was ideal for this study as it helped us to pinpoint the mechanisms underlying the effects of our multivariate model on South African entrepreneurship as well as define their boundary conditions or

contingencies (Hayes, 2018). Additionally, addressing questions of *how* two or more variables interact helped us to develop a deeper understanding of the phenomenon and South African entrepreneurship processes we investigated giving us essential insights into how that understanding can be incorporated into mainstream entrepreneurship research. Considering that our focus was on examining *how* digital self-efficacy and technostress interact passion and benefits of technology in shaping early-stage entrepreneurs' entrepreneurial intention, a process-based approach involving a comprehensive digital technology-technostress-entrepreneurial intention analysis was most appropriate for this investigation.

Unlike Covariance based SEM (CB-SEM), which advocates for reflective measurement of indicators, we utilised Smart PLS SEM—a model estimation which involves combining our indicators based on a linear method to form compositive variables. The advantage of using composite variables enabled us to focus on comprehensive representations of our construct. As a result we examined valid proxies of the conceptual variables represented in Fig. 1 (cf., Hair & Sarstedt, 2019). This gave use some reflectively and formatively specified measurement models in PLS-SEM without limitations. To test for hypothesized associative relationships, we used correlation analysis. As a comprehensive methodology for representing, estimating, and testing a theoretical model to explain the maximum variance possible (Ramlall, 2017), Smart PLS-SEM was used to evaluate the structural relationships of the variables specified in the conceptual model. It uses confirmatory factor analysis (CFA), to establish construct reliability, convergent validity, and discriminant validity, and conduct structural model analyses (standardized regression path) (Gallagher & Brown, 2013). The first step in PLS SEM was to conduct factor analysis (CFA) to establish the validity and reliability of the measurements used in the models, meaning the relationships between the indicators and their respective latent variables and the relationship between latent variables (Brown, 2015).

Reliability: reliability concerns the extent to which the measurement of a phenomenon provides stable and consistent results (Taherdoost, 2016). For this study, we used the scale reliability test in SEM based on Cronbach's alpha and composite reliability (Field, 2024). Our cut-off value on Cronbach's alpha and composite reliability (CR) was 0.7. Notwithstanding this, research suggests that a value of 0.6 is also permissible (Malhothra et al., 2017). Results in Table 1 show that the Cronbach's alpha ranges from 0.812 to 0.892, indicating an overall acceptable internal consistency of all six (6) latent variables considered in the model. Therefore, all constructs involved in this study are considered reliable based on these results.

Convergent validity: convergent validity is the extent to which a set of items only measures one latent variable in the same direction (Hosany et al., 2015). Our results provide evidence of the convergent validity because all the factor loadings are above or equal to 0.5. In addition, the Average Variance Extracted (AVEs) estimates are above 0.5.

The results in Table 1, statistically support the reliability and the convergent validity of the items retained in our final model. In other words, the items included in our final model are good measures of their respective constructs.

Discriminant validity: discriminant validity relate to how a latent variable or construct discriminates from other latent variables (Taherdoost, 2016). According to Fornell and Larcker (1981), the square root of the AVE is expected to be above the inter-construct correlation coefficients. Discriminant validity for this study was assessed by comparing correlations between all pairs of constructs with the square root of the AVE of each construct (Malhotra et al., 2017). Correlations greater than the square root of AVE indicate poor discriminant validity between the constructs involved. Table 2 illustrates that there is no discriminant validity concern between the constructs. The HTMT outcomes in Table 3 further strengthen this result, and this does not present a discriminant validity issue. The HTMT test generates ratios that assess how any two constructs share common variance. The ratios are not supposed to exceed 0.9 (Henseler, Dijkstra, et al., 2015).

Table 1
Reliability and the convergent validity of items.

Constructs	Items	Factor loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Digital Self Efficacy	DSE1	0.731	0.847	0.848	0.621
	DSE2	0.805			
	DSE3	0.810			
	DSE4	0.796			
	DSE5	0.796			
Entrepreneurship Intention	EI1	0.810	0.812	0.812	0.639
	EI2	0.802			
	EI3	0.816			
	EI4	0.769			
Entrepreneurial Passion	EP1	0.734	0.857	0.858	0.637
	EP2	0.843			
	EP3	0.803			
	EP4	0.830			
	EP5	0.777			
Technostress	Iva	0.913	0.861	0.869	0.709
	UNCa	0.732			
	COMa	0.905			
	Ova	0.805			
Perceived Behavioural control	PBC1	0.686	0.852	0.854	0.576
	PBC2	0.815			
	PBC3	0.763			
	PBC4	0.761			
	PBC5	0.765			
	PBC6	0.758			
Benefits of digital technology	PBDT1	0.724	0.892	0.892	0.608
	PBDT2	0.756			
	PBDT3	0.798			
	PBDT4	0.792			
	PBDT5	0.804			
	PBDT6	0.781			
	PBDT7	0.798			

*Indicates the significance of the factor at a 99 % confidence interval.

Table 2
Fornell and Larker criterion.

	Benefits of Digital Technology	Digital Self-Efficacy	Entrepreneurial Passion	Entrepreneurship Intention	Perceived Behavioural Control	Technostress
Benefits of Digital Technology	**0.779**					
Digital Self-Efficacy	0.726	**0.788**				
Entrepreneurial Passion	0.663	0.585	**0.798**			
Entrepreneurship Intention	0.561	0.558	0.642	**0.800**		
Perceived Behavioural Control	0.555	0.574	0.686	0.710	**0.759**	
Technostress	0.264	0.389	0.252	0.332	0.410	**0.842**

Table 3
HTMT.

	Benefits of Digital Technology	Digital Self-Efficacy	Entrepreneurial Passion	Entrepreneurship Intention	Perceived Behavioural Control
Digital Self-Efficacy	0.836				
Entrepreneurial Passion	0.758	0.686			
Entrepreneurship Intention	0.658	0.672	0.768		
Perceived Behavioural Control	0.635	0.672	0.803	0.849	
Technostress	0.290	0.440	0.279	0.382	0.464

4.6. Structural model analysis

The structural model examined the structural model path coefficients (β), coefficient of determination (R^2) and effect size (f^2).

The model was developed and tested to appraise the significance of the constructs. Fig. 2 is the structural model that summarises the hypothesis testing and PLS generated results of the variables. The empirical model highlights that digital self-efficacy accounts for 57 % (R^2), technostress accounts for 21.5 % (R2) while entrepreneurship intention explains 56.8 % (R^2) of the variance. These findings are summarised in Table 4 below.

4.7. Hypotheses tests outcomes

Table 5 illustrates the independent variables' predictive effects on dependent variables. The Beta values indicate the direction and strength of the relationships, while the *p-values* (*sig.*) estimate the significance of the predictive effect (Pallant, 2010, pp. 53–141). The significance of the relationship is supported if the *p-value* is below 0.05. An $f^2 \leq 0.14$ indicates a small effect size. While an f^2 between 0.15 and 0.34 (inclusive) is a medium effect, and an $f^2 \geq 0.35$ is considered a large effect size.

5. Results

The results of the study suggest that perceived behavioural control has a positive (β = 0.443), but medium (f^2 between 0.15 and 0.34 (inclusive) significant (P < 0.05) effect on entrepreneurship intention. This means the more early-stage entrepreneurs exhibit greater control over their destiny (i.e. perceived behavioural control), the greater their positive inclination towards pursuing entrepreneurship as a career. The findings further demonstrate that, entrepreneurial passion has a positive (β = 0.208), but small ($f^2 \leq 0.14$) significant (P < 0.05) effect on entrepreneurship intention.

The positive association between entrepreneurship passion and

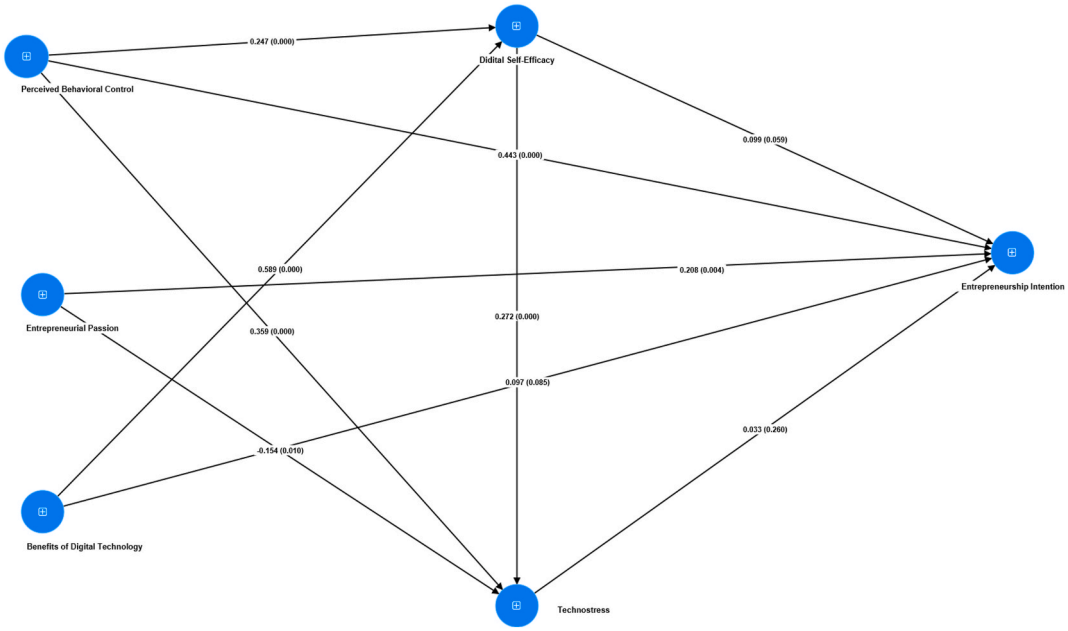

Fig. 2. Structural model.

Table 4
R square results.

	R square
Digital Self-Efficacy	0.570
Entrepreneurship Intention	0.568
Technostress	0.215

intention implies that the greater the passion early-stage entrepreneurs display towards entrepreneurial intentions, the more they will be inclined to pursue entrepreneurship in the future. However, the concept benefits of digital technology has a non-significant effect ($P > 0.05$) on entrepreneurship intention. Moreover, digital self-efficacy has a non-significant effect ($P > 0.05$) on entrepreneurship intention. Furthermore, technostress has a non-significant effect ($P > 0.05$) on entrepreneurship intention. Perceived behavioural control has a positive ($\beta = 0.359$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on technostress. This positive moderately significant association between perceived behavioural control and technostress means that for every one-point increase in the PBC mean score, the mean score of the technostress scale improves by 0.359. This means that as early-stage entrepreneurs gain more skills and control over the outcomes of their actions and behaviour, their level of technostress is decreased moderately. Evidence further suggests perceived behavioural control has a positive ($\beta = 0.247$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on digital self-efficacy. The positive association between these concepts suggests that the more control early-stage entrepreneurs have on the outcome of their intentions, the more they increase their beliefs and capabilities to successfully perform the tasks effectively and efficiently using digital technologies.

Evidence also demonstrates that the concept benefits of digital technology has a positive ($\beta = 0.589$), and significant effect ($P < 0.05$; $f^2 \geq 0.35$) on digital self-efficacy. This means that for every one-point increase in the benefits of digital technology mean score, the mean score of digital self-efficacy increases by 0.589. Furthermore, digital self-efficacy has a positive ($\beta = 0.272$), but small ($f2 \leq 0.14$) significant ($P < 0.05$) effect on technostress. The positive association between these variables means that the more early-stage entrepreneurs increase their confidence and ability to deploy their entrepreneurial action and behaviour using digital technologies, the more their levels of technostress levels increases.

6. Discussion

The advent of digital technology has transformed entrepreneurship landscapes across many parts of the global regions (Audretsch et al., 2024; Nkwei et al., 2023; Upadhyay et al., 2023). It has brought tangible benefits for businesses, including but not limited to cost-saving operations and related efficiencies (Rosin et al., 2020). Similarly, research suggests that digital technology has also contributed to some of the health and psychology problems associated with its excessive consumption, termed technostress in entrepreneurship research (Simba et al., 2025). Although this phenomenon has attracted attention in research, the focus has been on small firms (Thurik et al., 2024) and large organisations (Ayyagari et al., 2011) mainly operating in advanced economies (Tarafdar et al., 2024). However, there is little research that has focused on early-stage entrepreneurs in a non-Western setup.

Over-reliance on virtual interactions during crisis situations, for example, has inadvertently exacerbated work-related stressors including overload, time pressure, and poor communication (Parts, 2024; Thurik et al., 2024). This has resulted in intensified technostress-creating conditions. Research elsewhere suggests that technostress is a consequence of how people feel obligated to relate to their enterprising work in the digitalized workplace and society, and arises from internalizing the "ideal worker" image (Parts, 2024). To safeguard people from technology-driven issues, techno-security is essential. Research that

Table 5
Standardised regression weights and hypothesis outcomes.

Path coefficient	Beta value (0)	f^2	P Value	Outcomes
Benefits of digital technology - > Digital self-efficacy	0.589	0.558	0.000	Benefits of digital technology has a positive ($\beta = 0.589$), and significant effect ($P < 0.05$; $f^2 \geq 0.35$) on digital self-efficacy. Therefore, this hypothesis is accepted.
Benefits of digital technology - > Entrepreneurship intention	0.097	0.008	0.085	Benefits of digital technology has a non-significant effect ($P > 0.05$) on entrepreneurship intention. Therefore, this hypothesis is rejected.
Digital Self-Efficacy - > Entrepreneurship intention	0.099	0.009	0.059	Digital self-efficacy has a non-significant effect ($P > 0.05$) on Entrepreneurship intention. Therefore, this hypothesis is rejected.
Digital self-efficacy - > Technostress	0.272	0.057	0.000	Digital self-efficacy has a positive ($\beta = 0.272$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on technostress. Therefore, this hypothesis is accepted
Entrepreneurial Passion - > Entrepreneurship intention	0.208	0.041	0.004	Entrepreneurial passion has a positive ($\beta = 0.208$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on entrepreneurship intention. Therefore, this hypothesis is accepted is accepted.
Entrepreneurial passion - > Technostress	−0.154	0.014	0.010	Entrepreneurial passion has a negative ($\beta = -0.154$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on technostress. Therefore, this hypothesis is accepted.
Perceived behavioral control - > Digital self-efficacy	0.247	0.098	0.000	Perceived behavioral control has a positive ($\beta = 0.247$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on digital self-efficacy. Therefore, this hypothesis is accepted.
Perceived behavioral control - > Entrepreneurship intention	0.443	0.204	0.000	Perceived behavioral control has a positive ($\beta = 0.443$), but medium (f^2 between 0.15 and 0.34 (inclusive) significant ($P < 0.05$) effect on entrepreneurship intention. Therefore, this hypothesis is accepted.
Perceived behavioral control - > Technostress	0.359	0.080	0.000	Perceived behavioral control has a positive ($\beta = 0.359$), but small ($f^2 \leq 0.14$) significant ($P < 0.05$) effect on technostress. Therefore, this hypothesis is accepted.
Technostress - > Entrepreneurship Intention	0.033	0.002	0.260	Technostress has a non-significant effect ($P > 0.05$) on entrepreneurship intention. Therefore, this hypothesis is rejected.

debated sustainable economic revival initiatives in post crisis times emphasised the importance of techno-security (Bhanot et al., 2023). This research highlighted the essence of digital literacy and upgrades in technology capabilities as key challenges of a post crisis situation. In such situations including but not limited to COVID-19, most businesses responded to supply chain disruptions by using technology (Qrunfleh, Vivek, Merz, & Mathivathanan, 2023). But little is known about how their strategic responses, from moderate use of technology to optimum, influenced technostress and digital self-efficacy in entrepreneurial firms. Much of the literature on the accelerated use of digital technology in a crisis situation overlooks issues of technostress and digital self-efficacy. For example, El Khoury et al. (2023) studied the impact of green supply chain management practices on environmental performance during the COVID-19 disruptions with a focus on sustainable practices in times of crisis. Similarly, Fares et al. (2023) paid attention to the enablers of post-COVID-19 customer demand resilience, overlooking the importance of understanding digital self-efficacy and technostress in entrepreneurial settings.

Considering this research oversight, this study signals a shift of attention towards focusing on early-stage entrepreneurship processes in African entrepreneurship. It draws upon a novel digital technology-technostress-entrepreneurial intention interface and reveals multiple relationships conspiring to influence early-stage African entrepreneurship. In some way, it advances new theoretical perspectives and interpretations to describe underlying mechanisms of human social behaviour (Azjen, 2002; Tausch & Becker, 2013) in early-stage entrepreneurship processes of a non-Western entrepreneurial scenario (cf., Morris et al., 2023; Newbert et al., 2022; Wickert et al., 2024). Empirical findings generated through this theoretically-grounded approach to delineate the entrepreneurship process embedded in a rarely studied or misunderstood context of Africa generated unique and rich insights that seriously contributed to research.

The effects of low technostress on South African small businesses include high levels of IT-enabled productivity and above-average life satisfaction (Le Roux & Botha, 2021). On the contrary, recent research suggests that technostress effects the wellbeing and behaviors of nascent South African entrepreneurs (Simba et al., 2025). Studies elsewhere identify technostress dimensions of techno-complexity, techno-invasion and techno-insecurity, techno-uncertainty and techno-overload as the main causes of fatigue (Mangundu & Mayayise, 2023). Moreover, research identifies the pressure to facilitate compulsory online learning across Africa as the main cause of excessive consumption of technology among university students and lectures post COVID-19 (Govender & Mpungose, 2022).

Our theorisations of human social relations and behaviour derived at the nexus of digital self-efficacy (Bachmann et al., 2024), technostress (Ayyagari et al., 2011), and entrepreneurial intention (Nascimento et al., 2023) contributed a new theoretical pathway associated with South African entrepreneurship processes. This was based on empirical results confirming that early-stage entrepreneurship processes in South Africa are tangled in digital technology. In this context, the ability of early-stage entrepreneurs to use digital technology described as digital self-efficacy (van der Westhuizen & Goyayi, 2020) has an impact on their perceived behavioural control (Azjen, 1991), psychology, and mental wellbeing (Thurik et al., 2024)—technostress (Ayyagari et al., 2011). This digital self-efficacy impact is further amplified by early-stage entrepreneurs' passion for entrepreneurship and the perceived benefits of using digital technology. From that perspective, technostress has little effect on the entrepreneurial passion of early-stage entrepreneurs. Furthermore, the impact of technostress on the entrepreneurial intentions of early-stage entrepreneurs can not be statistically confirmed, which could be due to different reasons that have yet to be established. This ambivalence created by technology conditions suggests that the multiple relationships of digital self-efficacy, technostress, and entrepreneurial behaviour in a non-Western setup vary enormously. This advances new understanding, showcasing the temporal nature of entrepreneurship (Thai et al., 2024).

Because of this transient nature of entrepreneurship, our inferences point out the essence of contextualising theory building in entrepreneurship research (Bruton et al., 2022; Welter, 2011). Hence, and as previously stated, our context-sensitive theorisations of digital self-efficacy, technostress, and entrepreneurial intention antecedents in a non-Western setup enable a scholarly conversation with context (Hamann et al., 2020). In a way, such an approach assisted in discovering human social behaviours that are often hard to detect at the surface due to their embeddedness in local systems (Simba, 2024). Such context-specific insights contribute to entrepreneurship research through their indigenous theorisations (Bruton et al., 2022) of digital self-efficacy (Bachmann et al., 2024), technostress (Ayyagari et al., 2011), and entrepreneurial intention antecedents (Azjen, 2002) from an early-stage entrepreneurship perspective. Thus contributing knowledge about the entrepreneurship processes of a non-Western context.

6.1. Research and policy implications

Our empirical outcomes, theorisations, and analysis have profound implications for research. For academics, the ambivalent effect of our technology-technostress-entrepreneurial intention interface necessitates new studies to ascertain its usability in theorising entrepreneurship processes in non-Western settings. This is important as it contributes indigenous knowledge that is often used by mainstream research merely for making boundary changes to universal theories that mainly advance Western views (Shepherd et al., 2025; Simba, 2024). In addition to responding to research calls for contextualising theory development in entrepreneurship (Welter, 2011), such an approach enables scholarly conversation with context (Hamann et al., 2020). Furthermore, knowledge about psychological and mental wellbeing in entrepreneurship encourages entrepreneurship policy and social reforms to tackle excessive technology consumption in early-stage entrepreneurship. Focusing on policy and social reforms can guide the support of early-stage entrepreneurs in Africa whose livelihoods heavily depend on everyday entrepreneurship.

6.2. Limitations and suggestions for future research

As with any research project, our study has limitations. Its empirical results on the influence of technostress on the entrepreneurial intentions of early-stage entrepreneurs were inconclusive. This provides opportunities for future studies to explore different factors that may have led to this outcome. It might be that there are different technology conditions that were beyond the scope of this study. This necessitates further investigations using a larger sample size to improve the accuracy of the estimates. Related to that, our choice to use a cross-sectional survey design restricted our data collection to two (2) intervals, which consequently limited our technology-technostress-entrepreneurial intention analysis and its subsequent outcomes. Therefore, we recommend longitudinal studies over yearly data collection intervals due to the temporal and unscripted nature of entrepreneurship processes (Baumol, 1990). Furthermore, given that we focused on the South African context which is considered, by African standards, one of the 'developed' African countries compared to others across the continent, the generalizability of our results can be problematic. While this is a limitation of our study, it provides opportunities for future research. That is, we encourage future studies to utilize a different African context to test the connectivity of the variables we presented in Fig. 1. Such research can further ascertain our proposed digital technology-technostress-entrepreneurial intention conceptual interface.

7. Conclusions

The empirical tests conducted for this study demonstrate that in early-stage African entrepreneurship research, digital technology affects

entrepreneurial behavior and subsequent intentions. Although excessive digital technology use has psychological and mental health implications, early-stage entrepreneurs in Africa who had confidence in their ability to use digital technology significantly enhanced their intention to take up entrepreneurship. This underscores the effects of their perceived behavioural control. Interestingly, technostress—a technology-driven psychology and mental health problem associated with anxiety, depression, and distress does not diminish an early-stage entrepreneur's passion to engage in entrepreneurship in Africa. But, notably, empirical tests on its effects on the entrepreneurial intentions of these early-stage entrepreneurs generated inconclusive results. This study's originality relates to the way it delineates how technology ambivalence conditions variously influence multiple relationships of digital self-efficacy, technostress, and entrepreneurial behaviour in a non-Western setup.

7.1. Recommendations

Considering that technostress adversely impacts and frustrates the attainment of good health and social wellbeing (SDG Goal 3), decent work, and economic growth (SDG Goal 8), the following interventions are needed to prevent and manage its debilitating effects on early-stage entrepreneurs. As providers of policy guidance and policy dialogues, universities must institute student-centric social wellness policies and programs that emphasize healthy interactions between students and technology. These could include technology-free hours, more targeted and reduced provision of technology-mediated information to students, building technology websites with limited, uncomplicated features to reduce techno-complexity, techno-overload, techno-invasion, and techno-insecurity. Such websites could limit the availability and access to personal information, have limited features to reduce techno-complexity, creating avenues for offline interactions. Technology supported interaction after hours can also be reduced to limit techno-invasion among early-stage entrepreneurs. For countries such as South Africa where early-stage entrepreneurs have different levels of digital literacy, digital preparedness and confidence in the use of technology due to the digital divide, concerted efforts must be directed towards: Building more inclusive and resilient digital infrastructure, increasing exposure to computing devices and elevating digital literacy in high schools, and developing smart cities that tap into the benefits of digital technologies (cf. Scartozzi et al., 2025). Creating regional technology-supported ecosystems that benefit from inclusive technology integration into daily operations can also elevate early-stage entrepreneurs to become more enthusiastic digital citizens.

CRediT authorship contribution statement

Amon Simba: Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Patient Rambe:** Methodology, Funding acquisition, Data curation. **Paul Jones:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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