

Entrepreneurial intention: The role of the perceived benefits of digital technology



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Background: Existing research recognises that entrepreneurship orientation (EO) is essential for success. However, the mediating role of EO in driving entrepreneurial intention (EI) amongst young adults, especially in the context of the digital revolution, remains largely underexplored.

Aim: Accordingly, this study aimed to investigate the mediated effect of risk taking, innovativeness, and proactiveness on EI in an emerging economy.

Setting: The sample for this study was drawn from the young adult population in South Africa who understands the concept of entrepreneurship.

Method: In the study, a quantitative method to collect the data is used, while structural equation modelling is used to test the extended theory of planned behaviour (TPB).

Results: Findings indicate that risk taking mediates the effects of attitude, entrepreneurial capability, and the perceived benefits of digital technology on EI. The results did not support the mediating function of proactiveness and innovativeness. In fact, this result challenges the TPB's simplistic structure and reveals the prominent role of risk taking in determining TPB predictors.

Conclusion: Given the significance of risk taking, governments and entrepreneurship centres are urged to promote risk taking in all their entrepreneurship development programmes.

Contribution: Considering the significance of the global digital transformation, this study extends the TPB by incorporating the perceived benefits of digital technology among the predictors of entrepreneurial intent. It also emphasises the role of risk taking in mediating the effects of these predictors on the entrepreneurial intention of young adults in South Africa.

Keywords: entrepreneurial intention; theory of planned behaviour; perceived benefits of digital technology; risk taking; entrepreneurial capability.

Introduction

Entrepreneurship is widely regarded as the key to long-term economic prosperity (eds. Ács et al. 2009). It forms the backbone of leading economies such as in China, the United States, and Germany, which have instilled an entrepreneurial culture in their citizens. Inspired by these nations, in South Africa, as in most developing countries, the number of entrepreneurship courses to stimulate the entrepreneurship intention (EI) of the young adult population has increased; young people are of particular interest because they are disproportionately affected by unemployment, poverty, and inequality (Francis & Webster 2019). Although these entrepreneurship courses could create a positive attitude about entrepreneurship amongst young adults, as well as improve their entrepreneurship capabilities, the rate of early-stage entrepreneurs in South Africa remains low (11.7%) (Global Entrepreneurship Monitor 2018/2019).

Young adults are between the ages of 18 and 35, according to previous studies (Francis & Webster 2019), and make up nearly one-third of the total population of South Africa. However, only about 7.5% of these young adults engage in entrepreneurship (Global Entrepreneurship Monitor 2018/2019). Literature provides ample evidence that EI is the primary predictor of entrepreneurial behaviour (Meoli et al. 2020). Therefore, an understanding of the drivers of entrepreneurial intent may play a major role in increasing the number of aspiring entrepreneurs. Indeed, EI is arguably the most studied theme in entrepreneurship since the 1990s. Past discussions explored EI from generic perspectives, while many studies focused on facilitating conditions such as access to loans (Lee & Black 2017), incubation programmes, and various government support structures (Nakku et al. 2020). However, given the high failure rate of most business ventures globally, researchers

are triggered to examine the relationship between EI and key factors of entrepreneurial success, such as entrepreneurial orientation (EO), firm networking, and the use of technology in business (Zehir, Karaboğa & Başar 2020).

Research suggests that impactful entrepreneurs are opportunity-driven, technologically savvy, and have a high EO (Bosma & Kelley 2019). In contrast, generic entrepreneurs are less technologically oriented and necessity-driven; they are mainly found in emerging countries due to the scarcity of employment opportunities. While the distinction between impactful and generic entrepreneurs offers a framework for successful entrepreneurship, it is argued in this study that the criteria which informed this specific classification, do not always reflect the digital transformations unfolding in developing countries. Although necessity-driven entrepreneurship is often associated with a resource-constraint contexts, such as those prevalent in developing countries (e.g. South Africa), most young entrepreneurs, due to their extensive exposure to digital technology, are digitally savvy. In South Africa, the commission on the Fourth Industrial Revolution (4IR) was entrusted with conscientising young adults about the advantages of technologically supported innovations for entrepreneurial purposes. Given the emergence of these necessity-driven and technologically savvy entrepreneurs, we propose adding this class as a third category to Bosma and Kelley's (2019) classification.

Digital transformation is the increased use of digital technologies to create or alter customer experiences, business processes, and culture to meet the demand of the market. Indeed, this transformation has altered the dynamics of business creation, perception, and growth. Technologies such as artificial intelligence (AI), the Internet of Things (IoT), blockchain, social media, and additive manufacturing processes have simplified business practices (Chatterjee et al. 2021). These technologies empowered many small, micro-, and medium-sized enterprises (SMMEs) and enabled them to compete with large firms globally. Although some scholars speculate that the benefits of digital technology may contribute to both EO and EI, no prior study has established these relationships yet (Darmanto et al. 2022).

Past studies of entrepreneurship (Bagale et al. 2021) examined the adoption of digital technology in SMMEs, but the extent to which the benefits of digital technology affect EI, remains underexplored. Although many business concepts such as Canvas, Voluntary Technology Dialogue Framework (VTDF), and Creativity, Content Common sense (3C) model use digital technology as an instrument of innovation and proactiveness, the interplay between EO, and the benefits of digital technology has received limited attention. Against this background, our study investigated the intervening role of EO in driving the EI of young adults in a digital-revolution context; therefore, risk taking, innovativeness, and proactiveness are tested as potential mediators. Building from this extended theory of planned behaviour (TPB), our study contributes to the literature on entrepreneurship in three major ways.

Firstly, it proposes an alternative method for measuring the perceived benefits of digital technology that future studies could use for inferential analyses. With the digital transformation, there is a growing need for frameworks that evaluate various aspects of digital technology. Despite the fact that literature documents the benefits of digital technology for businesses, no valid instrument has yet been developed to measure how aspiring entrepreneurs perceive these benefits. This new construct expands the modelling toolkit of digital technology.

Secondly, the study expands and enriches the TPB, via indirect paths, mediated by risk taking, innovativeness, and proactiveness. It provides new TPB perspectives on how dimensions of entrepreneurial orientation (risk taking, inventiveness, and proactiveness) interact with attitude, entrepreneurial capability, and the perceived benefits of digital technology in shaping entrepreneurial intent in the context of a developing economy. This answers research calls for contextualising entrepreneurship research. These three EO elements are crucial for entrepreneurial success; therefore, integrating them as mediators into the TPB will provide a deeper understanding of how EO regulates the effects of the TPB predictors on EI. This study will contribute to the entire body of knowledge by showcasing how EO either facilitates or inhibits the effect of attitude and entrepreneurial capability on EI, allowing us to promote EO as a proxy for the TPB predictors.

Thirdly, in a country where the unemployment rate is estimated to be approximately 40%, the study provides new theorisation for exploring ways in which the EI of young adults may be enhanced congruently with their psychosocial conditions. Although entrepreneurial intent does not always result in action, it remains the most accurate predictor of new venture formation. Understanding the role of EO, as an intermediary, could help improve the government and entrepreneurship centres to stimulate the EI of young adults in South Africa, which will hopefully lead to the establishment of successful new businesses. In the subsequent sections of this paper the theoretical framework and development of hypotheses are discussed, followed by the methods, analysis, discussion, implication and future research, as well as limitations and the conclusion.

Theoretical framework

The theory of planned behaviour

The interpretations of the theory of planned behaviour produced a muddled picture of the meaning of EI. In the literature, numerous definitions of EI do not seem to converge. In light of that, the views of Crant (1996) on EI are adopted, showing it as the desire and the commitment to become a business owner in the future. Previous studies (Gorgievski et al. 2018) classified entrepreneurship as planned behaviour because it requires an intention to occur; this is probably why the TPB by Ajzen (1991) is so prevalent in entrepreneurship studies.

The TPB posits that EI is a function of attitude towards entrepreneurship, social norms, and the perceived ability to establish a business (entrepreneurial capability). Although recent studies (e.g. Ogunsade et al. 2021) found that attitude and entrepreneurial capability are the core predictors of EI amongst university students, the predictive power of these two factors generally is yet to be established among young adults in developing countries.

Despite its wide application, critics argue that the simplistic structure of TPB limits its ability to unveil the complexity of EI. Although many TPB studies included additional factors, such as education regarding entrepreneurship, opportunity recognition, family background, or EO (Shekarian & Parast 2021), most of these studies only examined the direct effects of the predictors. Given the growing number of indirect mechanisms by which these TPB relationships occur in real life, there is a rising demand for mediating or moderating variables in TPB studies that unveil the complexities of EI.

According to Van Trang, Do and Luong (2019), the fear of business failure impedes EI, even among young adults with entrepreneurial skills. Therefore, integrating dimensions of entrepreneurial orientation such as risk taking, innovation, and proactiveness into the TPB, will give greater insight into the intervening role of EO which is critical to counter the fear of business failure.

The concept of entrepreneurial orientation

Entrepreneurial orientation is the proclivity to take risks, innovate, and be proactive in pursuing a business. The willingness to take chances with a business idea is known as risk taking. Proactivity is the capacity to foresee future business prospects in terms of products, or technologies, and act on them. The ability to translate new ideas into new products, services, or technological processes is called innovativeness. Literature shows that EO is a crucial complement to EI (Fatoki 2019). While EI spurs entrepreneurs to start businesses, EO helps entrepreneurs run their businesses successfully with an entrepreneurial mindset (Marques et al. 2018). Numerous advantages accrue from an EO; it boosts learning and employment capacities and confers a competitive advantage. It also serves as a predictor of business growth and brand success (Jiang, Wang & Jiang 2019).

Although experts believe that EO is advantageous to entrepreneurship, there is considerable disagreement on how best it can be measured. Most studies (Mandongwe & Jaravaza 2020) measured EO as a single factor, while others (Amin 2015) divided it into three sub-dimensions. Those who support the multi-dimensional measurement argue that the dimensions of EO exist independently of one another. For example, Neneh, Van Zyl and Van Noordwijk (2016) discovered that male entrepreneurs are higher risk takers than female entrepreneurs, while female entrepreneurs are more proactive than male entrepreneurs. Considering that each component of EO may play a unique role, combining them into a single factor would undermine their contributions.

The link between EO and EI among young adults has been established in various developing countries such as Indonesia (Suartha & Suprapti 2016), Nigeria (Ibrahim & Mas'ud 2016), Zimbabwe (Mandongwe & Jaravaza 2020), and South Africa (Fatoki 2019). Most of these studies combined EO with other predictors of EI, such as attitude and family background (Wan-Ismail & Olabinjo 2017); fear of failure and entrepreneurial self-efficacy (Okoye 2016); self-efficacy and social networks (Ojewumi & Fagbenro 2019); educational support for entrepreneurship and informal networking (Amos, Oluseye & Bosede 2015); gender and self-efficacy (Ojewumi et al. 2018). Although EO has been extensively studied, there are three limitations to be observed: (1) most studies have been conducted in a firm-based setting and a Western environment, (2) only a few studies have examined the concept from the standpoint of young adults in connection with digital technology, (3) limited studies have examined the indirect effects of these predictors through each sub-dimension of EO.

Since EO and its sub-dimensions (risk taking, innovativeness, and proactivity) are conceptualised and predominantly applied in Western contexts, they may have different meanings and roles in developing nations. For instance, due to the scarcity of jobs, most young adults in South Africa do not have the privilege of choosing between work and entrepreneurship (Neneh et al. 2016). So, their concept of risk may differ from that fostered in Western nations where employment is not of significant concern. Following this contextual difference, validating the roles and significance of these three sub-dimensions of entrepreneurial orientation in a developing country such as South Africa, is necessary.

Based on previously-stated EO definitions, technology has emerged as one of the levers through which innovation and proactiveness are expressed (Crant 1996). In contemporary times, new ventures do not necessarily create new products; they can generate revenue by selling existing products on digital platforms. There is an increasing demand for new digital platforms which are business-friendly and more convenient for product delivery. Therefore, understanding the benefits of digital technology for entrepreneurial orientation and intention is essential, particularly in South Africa, where most young individuals are already accustomed to digital technology.

Perceived benefits of digital technology

The digital revolution is a reality; it is at the forefront of the 4IR, transforming all aspects of the human experience, including entrepreneurship. Indeed, with the growing access to computers, smartphones, the internet, and social media, the business landscape and practices have been extensively transformed. Consequently, it is more important for a company to have a website than an office building (Jahan & Martin 2019).

Emerging research on digitalisation recognises that digital technology provides numerous benefits to businesses. This body of knowledge suggests that digitalisation reduces transaction costs by improving and speeding up information access, allowing SMMEs to communicate with internal

personnel and external suppliers (Jin & Hurd 2018). Moreover, it reduces shipping and border costs, helping SMMEs integrate with global markets. In some way, digitalisation offers a range of applications with the potential to improve business performance, inspire innovation, and raise productivity. It also helps small and medium-sized enterprises (SMEs) to compete more equitably with larger firms by decreasing operational costs, economies of scale, and information asymmetries. These benefits make entrepreneurship more attractive to young adults as a career of choice. While research acknowledges the benefits of digital technology, it lacks a proper measurement framework and hence the need to examine its role in shaping EI.

Previous research studied digital technology in relation to EI. For instance, the relationship between the digitalisation of the economy and the EI of young adults has been explored (Youssef et al. 2021). Rambe, Ndofirepi and Dzansi (2016) concluded that EO led to intention in their study and that technological creativity (innovativeness) and entrepreneurial capability affect the EO of young adults in Zimbabwe. Research elsewhere investigated the link between digital literacy and EI (Primahendra et al. 2021).

The study by Rosin et al. (2020) in particular is one of the rare studies which examined the benefits of digitalisation in the context of a joint venture. They discovered that the digitalisation of small and medium-sized businesses results in resource savings, increased operational efficiency, and greater flexibility. Although the study of Rosin et al. (2020) provides valuable insight into the contribution of digital technology to business, it presents two significant limitations: (1) most of the benefits were formulated from an existing joint-venture perspective, not from that of aspiring entrepreneurs, and (2) the study largely considered the operational benefits without measuring the perceived benefits. Their study provides an opportunity for further research to examine the indirect effect of the benefits of digital technology on EI among young adults.

Conceptual framework

Proposed conceptual model and hypotheses development

Building on the TPB, the proposed conceptual model (Figure 1) hypothesises that the effects of attitude, entrepreneurial capability, and perceived benefits of digital technology on (EI) are mediated by risk taking, innovativeness, and proactiveness. The conceptual model is estimated after controlling for entrepreneurial family background, prior education about entrepreneurship, and digital technological literacy. These factors are controlled because they may inflate the relationships specified in the conceptual model.

Hypotheses development

The mediating role of entrepreneurship orientation in the relationship between attitude and entrepreneurial intention

Entrepreneurial attitude is the psychological disposition to encourage or oppose entrepreneurship after having weighed

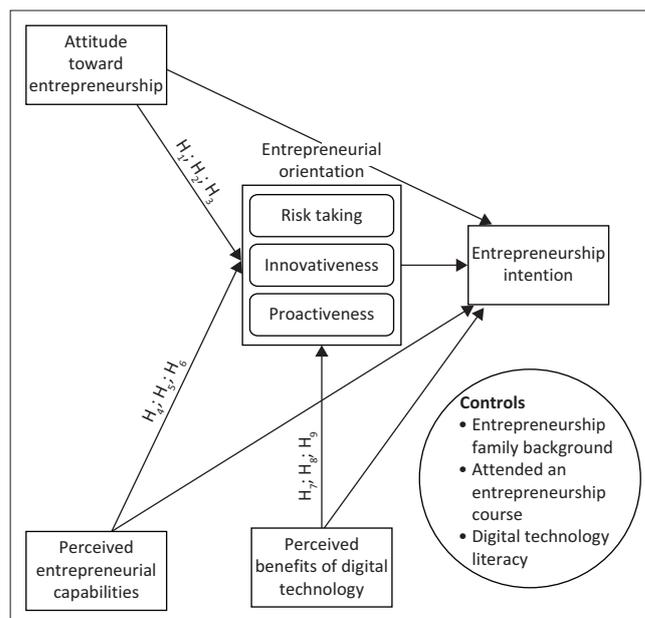


FIGURE 1: Conceptual research model.

its merits (Kreitner & Kinicki 2009). A potential entrepreneur is expected to have developed a positive attitude towards creating a new venture before forming the intent to start a business. However, in some studies it is found that the relationship between entrepreneurial attitude and intention is not always linear; it sometimes involves intervening factors. For instance, Song, Thomianathan and Khalid (2021) discovered that pertinent education enhances (mediates) the effect of attitude towards EI. Dahalan, Jaafar and Rosdi (2015) found that the impact of attitude on EI is stronger when a business opportunity (mediator) is identified.

Although limited studies have investigated the intervening role of risk taking, innovativeness, and proactiveness in EI, their mediating role is well established in other matters. For example, Liu et al. (2019) found that risk taking mediates the effect of Buddhist values on new venture performance in China. In Vietnam, Nguyen, An and Ngo (2020), found that proactiveness mediates the effect of relationship quality on firm performance. Zanella et al. (2019) also found that innovativeness and proactiveness mediate the relationships between individual alertness and the identification of an opportunity. Similarly, this study postulates that young adults with a positive attitude toward entrepreneurship will find it easier to develop the ambition to become entrepreneurs, especially if they are innovative, proactive, and willing to take risks. Hence the following hypotheses are formulated:

H₁: Risk taking mediates the effect of attitude on EI.

H₂: Innovativeness mediates the effect of attitude on EI.

H₃: Proactiveness mediates the effect of attitude on EI.

The intermediary role of entrepreneurship orientation in the relationship between entrepreneurial capability and entrepreneurial intention

Entrepreneurial capability is essential to becoming an entrepreneur and succeeding in establishing new business

ventures. Elsewhere, it is described as the entrepreneurial potential expressed or dormant in an individual (Ratnaningtyas, Sutardi & Makbul 2018). From a TPB perspective, entrepreneurial capability is a form of perceived behavioural control applied to entrepreneurial and technical skills (Nguyen et al. 2019). Prior empirical research has found that EO is associated with entrepreneurial capability (Anak Agung Ketut et al. 2018).

An individual's entrepreneurial capability is necessitated by the development of the individual's EO. There is also empirical evidence linking entrepreneurial capability to intention. Through their research on young adults' entrepreneurial activity in Nigeria, Jegede and Nieuwenhuizen (2021) found that this kind of capability and EO were key predictors of EI. Given that entrepreneurial capability influences EO and that both the capability and EO are associated with EI, EO could mediate the relationship between capability and intention to start a business. Hence, the subsequent hypotheses:

- H₄: Risk taking mediates the effect of entrepreneurial capability on EI.
- H₅: Innovativeness mediates the effect of entrepreneurial capability on EI.
- H₆: Proactiveness mediates the effect of entrepreneurial capability on EI.

The effect of perceived benefits of digital technology on entrepreneurial intention through entrepreneurial orientation

Perceived benefits of digital technology refer to an individual's opinion toward all applications of digital technology aiding the creation and expansion of businesses. The widespread use of digital technologies facilitated entrepreneurial education and stimulated EI. Scholarly research (e.g. Chatterjee et al. 2021) associated proactiveness and innovativeness with digital entrepreneurship. In relation to that, Goktan and Gupta (2015) found that EO facilitates the adoption and use of new digital technology. Similarly, Kraus et al. (2019) discovered that innovative and proactive people are more likely to explore new business opportunities using digital technology.

The mediating effect of EO in relation to digital technology was established by previous research. Findings suggested that young individuals' perceptions of digital technology either encourage or discourage their pursuit of digital entrepreneurship. Nguyen, An and Ngo (2020) found that proactiveness mediates the relationship between social capital and company performance. The digitalisation of economies stimulates EI by lowering the perceived risks associated with starting a business (Youssef et al. 2021). Simply put, risk taking mediates the relationship between the digitalisation of economies and EI. Given the findings above, the study submits that the effect of perceived benefits on EI may be enhanced by EO. Hence, the following hypotheses:

- H₇: Risk taking mediates the effect of perceived benefits of digital technology on EI.

H₈: Innovativeness mediates the effect of perceived benefits of digital technology on EI.

H₉: Proactiveness mediates the effect of perceived benefits of digital technology on EI.

Method

This study focuses on young adults for two reasons: firstly, they are one of the segments most affected by poverty, unemployment, and inequality in South Africa (Francis & Webster 2019). Therefore, venturing into entrepreneurship might be an effective way to achieve financial stability. Additionally, the ongoing digital transformation provides limitless opportunities for young adults to start and grow businesses. As a result, the South African Presidential Commission on 4IR urged youths to benefit from the technological transformation brought about by 4IR. According to past research (Ondimu et al. 2019), young adults are between 18 and 35 years old; therefore, this age group was the focus of our study. Before proceeding with the survey, the concept of entrepreneurship was defined and participants were required to confirm that they understood it. This inquiry served as the second screening question.

The study adopted a positivist, and cross-sectional approach for two reasons: (1) the measurements of all the concepts, involved in this study, were already available in the literature, and (2) the study aimed to test a conceptual model in a specific context and at a specific time. Participants were recruited online by a consulting firm for 3 months. Since the survey was conducted online, a non-probabilistic sampling method was more practical because of the pandemic and the lack of a sampling frame for the target population. The link to the survey was sent to 1253 young adults across the country, and 822 questionnaires were returned. After eliminating disengaged respondents and those older than 35, we were left with 617 valid questionnaires. The purpose of the study and the participants' rights were outlined in an attached informed consent form. All participants were requested to sign the form electronically before completing the online survey. Ethical clearance for the study was provided by the Departmental Research and Ethics Committee of the Central University of Technology in South Africa.

A questionnaire was used to collect data related to the variables involved in the study. The first section of the questionnaire captured the respondents' demographic information, such as their gender, age, education, province, marital and employment status. The second section contained screening questions that ensured that we only select young adults who are not yet business owners. The rest of the questionnaire focused on the model's seven constructs, all measured on a Five-step Likert scale. The constructs were adapted from previous studies and covered three (03) to seven (07) items each. The constructs attitude (e.g. [1] being an entrepreneur would give me some satisfaction, and [2] a career as an entrepreneur is attractive to me) and entrepreneurship intention (e.g. [1] I intend to create a firm in the future, and [2] I have thought very seriously of starting a

firm at some point) were both adapted from instruments from Asimakopoulos and Peña Miguel (2019) and Youssef et al. (2021). Perceived entrepreneurial capability (e.g. [1] I can identify new business opportunities, and [2] I can create products or services that fulfil customers' unmet needs) was adapted from Ndofirepi and Rambe (2016). The three dimensions of EO were revised, based on the work of Koe (2016), and the construct perceived benefits of digital technology (e.g. [1] digital technology is a great source of information for me, and [2] digital technology presents business opportunities for me) was developed, inspired by the preliminary work of Owoseni and Twinomurizi (2019) on dynamic capabilities which is the ability to identify opportunities using digital technology.

After collecting the data, it was screened in Excel and imported into version 27 of IBM SPSS Statistics, where it was cleaned further. A descriptive analysis was conducted to describe the sample. Structural Equation Modelling (SEM) is a flexible and comprehensive method for testing a conceptual model to account for the maximum variance (Grotzinger et al. 2019). The aim of this study is to assess the structural relationships between the conceptual model's variables. Since the SEM methodology comprises confirmatory factor analysis (CFA) and structural model analysis, it was deemed suitable (Gallagher & Brown 2013). Confirmatory factor analysis assessed the validity of the constructs, whereas the structural model analysis tested the research hypotheses postulated in our conceptual models. The SEM analysis was conducted using IBM AMOS 28; the assumptions of sample size and multivariate normality were rigorously evaluated and satisfied (Byrne 2010).

Analysis

Profile of respondents

Descriptive statistics generated for this study indicated that all nine provinces of South Africa were disproportionately represented in the sample. Gauteng (68.1%), Limpopo (11.7%), and KwaZulu-Natal (7.8%) were the provinces with the highest representation. Most respondents (98.5%) were Black African males (51.5%), who held either a matric or a postgraduate degree (74.3%). An in-depth statistical analysis of the data showed that 47.6% of the participants were unmarried and either employed (42.9%), or students (30.2%). The average age of participants was 28 years old.

Control variables

Considering that the study investigates young adults in general, it was necessary to control for any variable that could give an advantage to some respondents over the rest of the sample. In the particular context, three potential confounding variables were identified, namely (1) prior education regarding entrepreneurship, (2) family background of entrepreneurship, and (3) digital literacy. Past research (Duong 2021) revealed that entrepreneurial education and an entrepreneurial family background do influence EI and EO scores; hence the decision to control their effects in the model.

Digital literacy was also controlled because it is most likely to affect the scores of the variable 'perceived benefit of digital technology'.

Structural equation modelling analysis

Structural equation modelling is a statistical technique that employs a confirmatory approach to model testing (Byrne 2010). The literature has two approaches to SEM: the covariance-based and the component-based methods. While the covariance-based approach requires large sample sizes (200 and above) to test a model, the component-based approach accommodates small sizes (less than 100). Since our sample is large (615 units), it was ideal to opt for a covariance-based approach of SEM.

Irrespective of the approach, SEM is conducted in two consecutive phases: (1) the CFA phase and (2) the structural model-analysis phase (Anderson & Gerbing 1988). Before the CFA, the outliers were examined through the skewness and kurtosis values; all items fell within the acceptable ranges of plus-minus 3 and minus 10, respectively (Kline 2015), indicating that the assumption of normality was not violated. A common-method bias test was performed through Harman's (1976) one-factor to detect any artificial inflation of relationships in the model. Harman's (1976) one-factor results indicate that the highest single factor accounts for the variance of 22.1% (below 50%). In conclusion, there is no common variance bias in the data.

Confirmatory factor analysis

The measurement model was tested to establish the validity of the constructs used in the study. The first item of risk taking was deleted because it was cross-loading with proactiveness; this helped to the improvement of the fit indices ($\chi^2 = 1026.637, p < 0.05, df = 443, \chi^2/df = 2.317$, Adjusted goodness of fit index [AGFI] = 0.868, Tucker-Lewis index [TLI] = 0.964, comparative fit index [CFI] = 0.968, and root mean square error of approximation [RMSEA] = 0.050).

The evidence of convergent validity was established through the AVE (average variance extracted), factor loadings, and composite reliability. As indicated in Table 1, all-composite reliability coefficients are above 0.7, meaning that all the items retained in the model are internally consistent. Additionally, all factor loadings are above 0.7, and all AVEs exceed 0.5 (Byrne 2010), proof that the convergent validity of the CFA model is supported.

The discriminant validity of the constructs was tested using the Fornell and Larcker (1981) matrix. The results support the discriminant validity, as the square root of the AVEs of all constructs (bold) are greater than the highest correlation coefficients of each construct (see Table 2).

Following the statistical evidence of model fit, and the convergent and discriminant validity, we move to the structural model analysis.

Structural model analysis

The structural model analysis tests the research hypotheses, specified in the conceptual model (Figure 1). Maximum likelihood was used as the model estimation method, and the fit indices of the structural model (Figure 2) were satisfactory ($\chi^2 = 1425.717$, $p < 0.05$, $df = 536$, $\chi^2/df = 2.660$, AGFI = 0.843, TLI = 0.947, CFI = 0.952, and RMSEA = 0.056). The robustness of the model is further established as there are reasonably high variances explained in the endogenous variables such as risk taking (63%), proactiveness (64%), innovativeness (69%), and EI (70%). According to Ceresia and Mendola (2020), the predictive power of the traditional TPB model

rarely exceeds 50% of the variance explained in EI. Therefore, this model performs better than the original TPB and many other extended versions of the TPB.

The model hypothesised that the effects of attitude, entrepreneurship capability and the perceived benefits of digital technology on EI are mediated by risk taking, innovativeness, and proactiveness. In other words, the study tests whether the presence of these three mediators affects the relationship between the three predictors (attitude, entrepreneurship capability, and perceived benefits of digital technology) and the main dependent variable (EI).

TABLE 1: Statistical evidence of reliability and convergent validity.

Constructs	Items	Factor loadings	Composite reliability	AVE (average variance extracted)
Entrepreneurship intention	EI1	0.893	0.924	0.753
	EI2	0.867		
	EI3	0.904		
	EI4	0.809		
Attitude	AT1	0.878	0.924	0.752
	AT2	0.865		
	AT3	0.903		
	AT4	0.820		
Risk taking	RT1	0.877	0.901	0.752
	RT2	0.856		
	RT3	0.868		
Proactiveness	Pro1	0.856	0.918	0.788
	Pro2	0.920		
	Pro3	0.887		
Innovativeness	In1	0.849	0.924	0.753
	In2	0.852		
	In3	0.884		
	In4	0.892		
Entrepreneurial capability	EC1	0.826	0.957	0.763
	EC2	0.847		
	EC3	0.883		
	EC4	0.891		
	EC5	0.902		
	EC6	0.869		
	EC7	0.893		
Perceived benefits of digital technology	PBDT1	0.877	0.964	0.793
	PBDT2	0.874		
	PBDT3	0.903		
	PBDT4	0.897		
	PBDT5	0.902		
	PBDT6	0.896		
	PBDT7	0.886		

AVE, average variance extracted; EI, Entrepreneurship intention; AT, Attitude; RT, Risk taking; PR, Proactiveness; IN, Innovativeness; EC, Entrepreneurship capability; PBDT, perceived benefits of digital technology.

TABLE 2: Evidence of discriminant validity.

Constructs	In	Attitude	E_Intent	Entre_Cap	PBDT	Proact	Risk_T
Innovativeness	0.868	-	-	-	-	-	-
Attitude	0.735	0.867	-	-	-	-	-
Entrepreneurship intention	0.688	0.809	0.868	-	-	-	-
Entrepreneurial capability	0.810	0.783	0.777	0.873	-	-	-
Perceived benefits of digital technology	0.663	0.620	0.550	0.658	0.891	-	-
Proactiveness	0.846	0.729	0.697	0.781	0.696	0.888	-
Risk taking	0.849	0.729	0.633	0.780	0.680	0.768	0.867

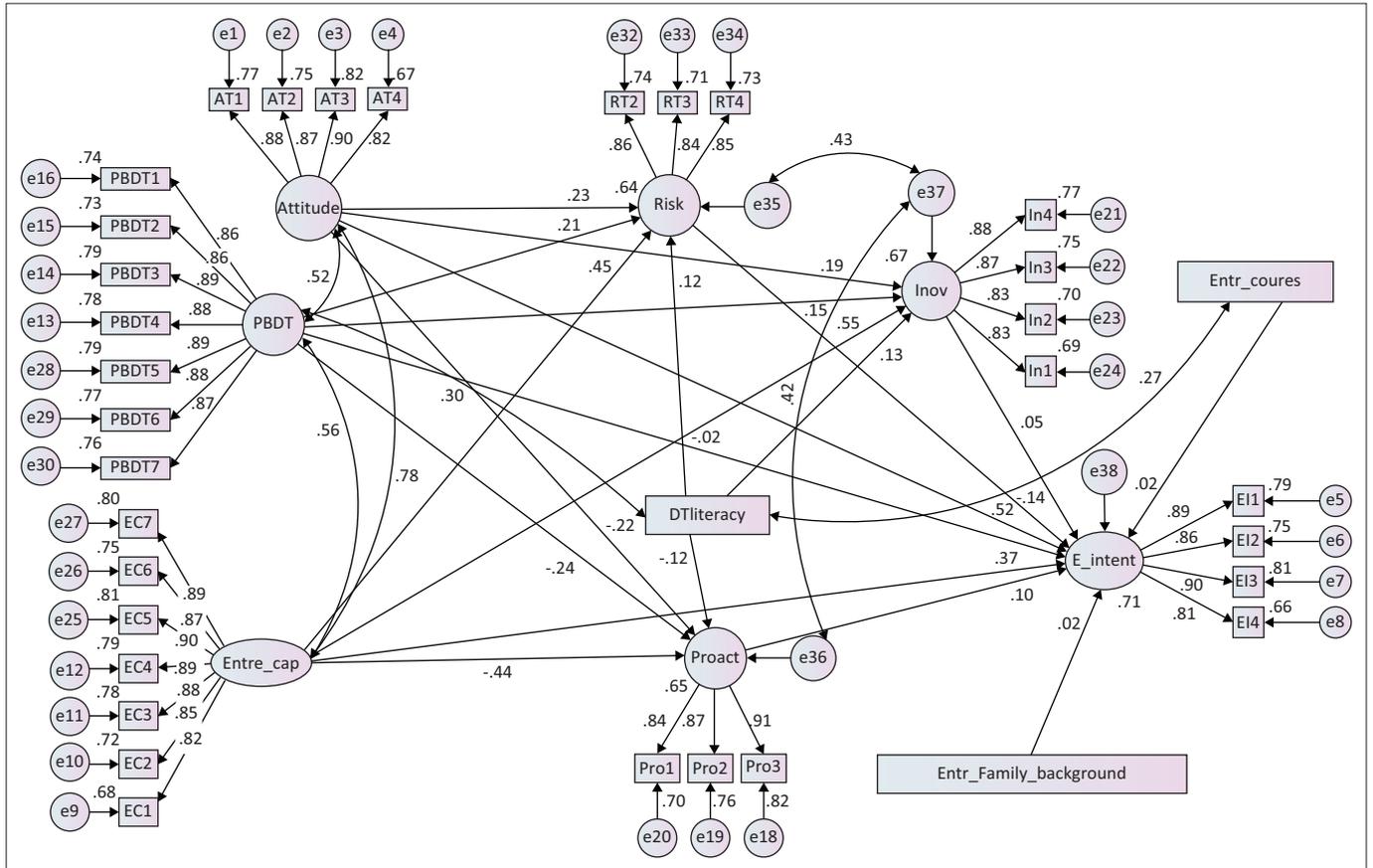
IN, Innovativeness; E_Intent, Entrepreneurship intention; Entre_Cap, Entrepreneurship capability; PBDT, perceived benefits of digital technology; Proact, Proactiveness; Risk_T, Risk taking.

After controlling for prior entrepreneurial education, family background of entrepreneurship, and digital technological literacy, the results reveal that the effects of attitude and capability on EI are partially mediated by risk taking (Table 3). This is because both the indirect (B_{indAT} estimate = -0.033; B_{indEC} estimate = -0.033, respectively, and $p < 0.05$ for both estimates) and direct (B_{AT} estimate = 0.519; B_{EC} estimate = 0.369, respectively, and $p < 0.05$ for both estimates) effects of these two predictors are statistically significant. The negative coefficients of the indirect effects mean that instead of decreasing the direct effect, the mediator amplifies it. Therefore, the direct effect of attitude and entrepreneurial capability on EI is stronger when risk taking is present. So, hypotheses H_1 and H_4 are supported.

Results further suggest that the effect of the perceived benefits of digital technology is fully mediated by risk taking as its indirect effect on EI is significant (B_{PBDT} estimate = -0.037, and $p = 0.05$), while its direct effect is non-significant (B_{PBDT} estimate = -0.018, and $p > 0.05$). This suggests that perceived benefits of digital technology are ineffective in driving EI, unless combined with risk taking. Therefore, H_7 is supported.

The data did not support the other hypotheses; they were, therefore, deemed non-significant.

According to the results, not all dimensions of EO mediate the predictors of EI. Although proactiveness predicts EI to some extent ($\beta = 0.129$, $p < 0.05$), it does not have a mediating function in the model. Risk taking is the only component of EO that mediates the effects of all three predictors (attitude, entrepreneurial capability and perceived benefits of digital technology) of EI. The impact of the two TPB predictors (attitude and entrepreneurial capability) is partially determined



Entre_Cap, Entrepreneurship capability; PBDT, perceived benefits of digital technology; Risk, Risk-taking; Inov, Innovativeness; Proact, Proactiveness; E_Intent, Entrepreneurship intention; DTliteracy, digital technology literacy; Entr_Course, entrepreneurship course; Entr_Family_background, entrepreneurial family background.

FIGURE 2: Structural model.

TABLE 3: Mediation analysis.

Mediated relationships	Indirect effect		Direct effect		Mediation	Type of mediation	Conclusion
	B estimate	P	B estimate	P			
AT → RT → EI	-0.033	0.034	0.519	0.01	Yes	Partial	H ₁ supported
AT → IN → EI	0.010	0.507	0.519	0.01	No	NA	H ₂ not supported
AT → PR → EI	0.023	0.226	0.519	0.01	No	NA	H ₃ not supported
EC → RT → EI	-0.069	0.034	0.369	0.009	Yes	Partial	H ₄ supported
EC → IN → EI	0.029	0.611	0.369	0.009	No	NA	H ₅ not supported
EC → PR → EI	0.049	0.255	0.369	0.009	No	NA	H ₆ not supported
PBDT → RT → EI	-0.037	0.050	-0.018	0.631	Yes	Full	H ₇ supported
PBDT → IN → EI	0.09	0.560	-0.018	0.631	No	NA	H ₈ not supported
PBDT → PR → EI	0.031	0.300	-0.018	0.631	No	NA	H ₉ not supported

AT, Attitude; EC, Entrepreneurial capability; PBDT, perceived benefits of digital technology; RT, Risk taking; IN, Innovativeness; PR, Proactiveness; EI, Entrepreneurial intention.

by risk taking (confirmed mediator); whereas the confirmed mediator entirely determines the effect of the perceived benefits of digital technology. The implication is that these three predictors need risk-taking to optimise their impact on EI.

Discussion

It was theoretically proposed that attitude, entrepreneurial capability, and the perceived benefits of digital technology affect EI via EO (risk taking, innovativeness, and proactiveness). However, the results revealed that risk taking is the sole element of EO that mediates the effect of the three predictors considered in the study. The implications of these findings are discussed next.

Theoretical implications

This study makes three significant contributions to the body of knowledge. Firstly, it contributes to the research on the entrepreneurial aspirations of young people in developing nations, while previous studies (Youssef et al. 2021) on EI focused on college students, assuming that entrepreneurial skills and attitudes can only be acquired through formal education. This study broadens the scope of inquiry by including all young adults, regardless of their academic background. We argue that in emerging nations like South Africa, many young adults lack access to formal entrepreneurial education in universities. However, those without a college degree may develop

their entrepreneurial skills on the job, or through participation in workshops and training events. This segment is unfortunately excluded from most studies; hence we call for more inclusive research on youth entrepreneurship in developing nations.

Secondly, recent research (Lisboa, Skarmeas & Saridakis 2016) emphasised the moderating role of EO, while the discussion on its mediating function remains underdeveloped. For instance, it was determined that proactiveness and innovation moderate the relationship between product advantages and success. The moderating role of the EO factors was also discovered in the relationship between a firm's ability 'to exploit new knowledge and its financial performance; explorative capabilities and new-product differentiation advantages' and organisational flexibility and strategic performance (e.g. Yousaf & Majid 2018). This study adds to the body of knowledge by demonstrating that EO factors may also play a mediating role in EI. We theorise that the impact of attitude, entrepreneurial capability, and the perceived benefits of digital technology on the EI of young adults depends on their risk-taking propensity.

Thirdly, the research utilised a decomposed approach of EO to predict EI. This method enables the assessment of the unique contribution of each component of EO to EI. Although risk taking, innovativeness, and proactiveness form EO, they do not all carry the same weight in predicting EI. The results of this study revealed that risk taking is the most important aspect of EO when predicting the EI of the youth in a developing country. It also appears to be a prominent factor in other studies not related to the current one. For instance, risk taking mediated the predictors of prenatal testosterone exposure, opportunity recognition, and personality traits (Bergner, Auburger & Paleczek 2021). Although both studies recognised risk taking as a mediator, their conclusions did not apply to EI, and they focused solely on risk taking while not considering the remaining two components of EO. We argue that even though risk taking, innovativeness, and proactiveness operate independently, they remain interconnected through the concept of EO. Therefore, this study improves the understanding of the EO framework by highlighting the prominence of risk taking within the broader framework of EO that includes innovativeness and proactiveness.

Lastly, the partial mediations found in this study theorise that attitude and entrepreneurial capability directly impact EI even in the absence of risk taking. This new perspective partially validates the TPB among young adults in general. The validation of risk taking as a partial mediator calls for the need to modify the simplified structure of the TPB, which postulates that the links between EI and its predictors (attitude and entrepreneurial capability) are linear (Ajzen 1991). To extend its applicability, this study provides a new pathway suggesting that TPB predictors affect EI through risk taking. The findings improve the TPB's predictive power by integrating risk taking as a mediator of the

predictors of EI. In other words, the propensity for risk taking contributes to the indirect mechanism by which attitude and entrepreneurial capability affect entrepreneurial intent. The authors are unaware of any previous model having established this.

Practical and policy-making implications

The insights generated in this research should be of great interest to policymakers and entrepreneurship centres, because they are the main promoters of the youth's entrepreneurship. The study illustrates that EI depends on the association that risk taking has with attitude, entrepreneurship capability, and perceived benefits of digital technology. Four practical implications can be formulated from these findings. Firstly, this result confirms the findings of previous research (Miaomiao & Xiaoyan 2019), that attitude and entrepreneurial skills are crucial for fostering EI among young adults in developing nations. Therefore, programmes that enhance entrepreneurship attitude and shape entrepreneurial skills would contribute to improving the level of EI among young adults.

Literature further indicates that entrepreneurial learnership is the most effective way of shaping attitude and entrepreneurial skills. This explains why developing countries are seeing an increase in the number of entrepreneurship centres. Although this increase is commendable, it is unfortunate that most of these centres are either very expensive or restricted to university graduates only. Like most micro-sized business owners, many aspiring young entrepreneurs do not have university education. So having universities as the primary hub for entrepreneurship education and training may pose challenges for potential entrepreneurs who cannot enrol in formal universities. Given that developing countries need more young adults with entrepreneurial skills, governments and non-governmental organisations (NGOs) may work together to launch entrepreneurship programmes open to all young adults regardless of their academic background.

Secondly, every business opportunity expires at some point; therefore, taking risks allows aspiring entrepreneurs to seize opportunities before they expire. This study demonstrates that risk taking is an enhancer of EI predictors as it amplifies their predictive effects. This outcome calls for a stronger emphasis on risk taking in educational entrepreneurship programs. For example, having a module that focuses specifically on risk taking, could help raise awareness about its significance and correct the misconception that risk taking is like gambling. Unpacking the concept of calculated risk, will aid in restoring the rationality of risk taking. Since entrepreneurship always involves some level of risk, entrepreneurship centres may provide guidelines to identify the business risks that are worth taking.

To enforce risk taking among young adults, the government and various stakeholders could adopt policies that encourage risk taking. For example, governments could offer research

grants to support high-risk businesses. This research would aim to accurately assess the business risk versus the potential of the opportunity. Non-governmental organisations, promoting youth entrepreneurship, may also use mass media or social media to share the success stories of young entrepreneurs who took risks to launch a business venture; this is known as social learning (Bandura 1986). When sharing their experiences, these role models could emphasise the importance of calculated risk taking and the advantages of having a business. These programmes could help to destigmatise risk taking, reduce the fear of business failure, and increase the propensity for risk taking among young adults in developing nations.

In modern economies, digital technology plays a central role. It provides numerous advantages, including access to global markets and reduced operational and logistic costs. In the study, it is found that the perceived benefits of digital technology influence the EI of young adults, depending on their propensity for taking risks (full mediator). Most young adults in developing nations prefer employment, because they believe entrepreneurship is resource-intensive and fraught with failure. A detailed course on the advantages of digital technology for start-ups could address this misconception and increase the appeal of entrepreneurship to young adults. Technology companies could offer specialised digital solutions for start-ups that foster business growth and development.

Conclusion, limitations, and future research

The aim of this study was to examine the mediating role of risk taking, innovativeness, and proactiveness in driving the EI of young adults in South Africa. The TPB was used as the theoretical framework, and three predictors were considered: attitude, entrepreneurial capability, and the perceived benefits of digital technology. The findings established that risk taking is the only component of EO that mediates the effects of these three predictors. It does not mean that innovation and proactiveness are unimportant in forming EI; instead, it suggests that innovativeness and proactiveness do not enhance the impact of attitude, entrepreneurial capability, and the perceived benefits of digital technology on EI. They might have other functions regarding EI, but not a mediating role.

Like any other study, this research is not free from limitations. Firstly, most respondents came from the Gauteng province (68%) and six (06) out of nine (09) provinces have a participation rate of less than 7%. Therefore, we suggest that in further studies the conceptual model is retested, using quotas that reflect the distribution of young adults across the nine provinces of South Africa. Secondly, the results may differ, based on the moderating effect of demographic variables such as gender, age, or employment status. As no interaction variable is considered in this study, future researchers are encouraged to investigate the moderating role of the demographics.

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Competing interests

The author(s) declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

E.S.N. wrote the original manuscript and P.R. and A.S. authors reviewed and added their inputs.

Ethical considerations

Ethical clearance was obtained from the Central University of Technology (FMSEC81122).

Your participation in this research is entirely voluntary and you can withdraw from the survey at any time without any reprisal or penalty. For ethical reasons, this research is aimed at adult participants only (persons aged 18 and above). In addition, you have the right to ask questions before, during, and after the administration of the questionnaire.

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Data availability

The data that support the findings of this study are available on request from the corresponding author, E.N.

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References

- Ács, Z.J., Audretsch, D.B., Strom, R. & Strom, R.J. (eds.), 2009, *Entrepreneurship, growth, and public policy*, Cambridge University Press, Cambridge.
- Ajzen, I., 1991, 'The theory of planned behavior', *Organizational behavior and human decision processes* 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Amos, A., Oluseye, O. & Bosede, A., 2015, 'Influence of contextual factors on entrepreneurial intention of university students: The Nigerian experience', *Journal of South African Business Research* 6, 2–10. <https://doi.org/10.5171/2015.750622>
- Anak Agung Ketut, S., Ida Ketut, K., I Ketut, Y.A. & Made, H.W., 2018, 'Entrepreneurial self-efficacy mediation in entrepreneurial competency prediction to entrepreneurial orientation', *International Journal of Multidisciplinary Educational Research* 78(2), 203–226.
- Anderson, J.C. & Gerbing, D.W., 1988, 'Structural equation modeling in practice: A review and recommended two-step approach', *Psychological Bulletin* 103(3), 411. <https://doi.org/10.1037/0033-2909.103.3.411>
- Asimakopoulos, G., Hernández, V. & Peña Miguel, J., 2019, 'Entrepreneurial intention of engineering students: The role of social norms and entrepreneurial self-efficacy', *Sustainability* 11(16), 4314. <https://doi.org/10.3390/su11164314>
- Bagale, G.S., Vandadi, V.R., Singh, D., Sharma, D.K., Garlapati, D.V.K., Bommesetti, R.K. et al., 2021, 'Small and medium-sized enterprises' contribution in digital technology', *Annals of Operations Research* 1–24. <https://doi.org/10.1007/s10479-021-04235-5>
- Bandura, A., 1986, *Social learning theory. 1 Foundations of thought and action*, Prentice-Hall, Hoboken, NJ.

- Bergner, S., Auburger, J. & Paleczek, D., 2021, 'The why and the how: A nexus on how opportunity, risk and personality affect entrepreneurial intention', *Journal of Small Business Management* 1–34. <https://doi.org/10.1080/00472778.2021.1934849>
- Bosma, N. & Kelley, D., 2019, *Global entrepreneurship monitor 2018/2019 global report*, Global Entrepreneurship Research Association (GERA), viewed 18 May 2022, from <https://www.gemconsortium.org/report/gem-2018-2019-global-report>.
- Byrne, B.M., 2010, *Structural equation modeling with AMOS: Basic concepts, applications, and programming (multivariate applications)*, Routledge, New York, NY.
- Ceresia, F. & Mendola, C., 2020, 'Am I an entrepreneur? Entrepreneurial self-identity as an antecedent of entrepreneurial intention', *Administrative Sciences* 10(3), 46. <https://doi.org/10.3390/admsci10030046>
- Chatterjee, S., Chaudhuri, R., Vrontis, D. & Basile, G., 2021, 'Digital transformation and entrepreneurship process in SMEs of India: A moderating role of adoption of AI-CRM capability and strategic planning', *Journal of Strategy and Management* 15(3), 416–433. <https://doi.org/10.1108/JSMA-02-2021-0049>
- Crant, M.J., 1996, 'The proactive personality scale as a predictor of entrepreneurial intentions', *Journal of Small Business Management* 34(3), 42–49.
- Dahalan, N., Jaafar, M. & Rosdi, S.A.M., 2015, 'Attitude and entrepreneurial intention among rural community: The mediating role of entrepreneurial opportunity recognition', in *SHS Web of Conferences*, vol. 18, p. 01005, EDP Sciences, viewed n.d., from https://www.shs-conferences.org/articles/shsconf/abs/2015/05/shsconf_icolass2014_01005/shsconf_icolass2014_01005.html.
- Darmanto, S., Ekopriyono, A. & Darmawan, D., 2022, 'Developing student's nascent digital entrepreneurial model', *Global Business & Finance Review* 27(6), 52.
- Fatoki, O., 2019, 'Sustainability orientation and sustainable entrepreneurial intentions of university students in South Africa', *Entrepreneurship and Sustainability Issues* 7(2), 990. [https://doi.org/10.9770/jesi.2019.7.2\(14\)](https://doi.org/10.9770/jesi.2019.7.2(14))
- Fornell, C. & Larcker, D.F., 1981, 'Structural equation models with unobservable variables and measurement error: Algebra and statistics', *Journal of Marketing Research* 18(3), 382–388. <https://doi.org/10.1177/002224378101800313>
- Francis, D. & Webster, E., 2019, 'Poverty and inequality in South Africa: Critical reflections', *Development Southern Africa* 36(6), 788–802. <https://doi.org/10.1080/0376835X.2019.1666703>
- Goktan, A.B. & Gupta, V.K., 2015, 'Sex, gender, and individual entrepreneurial orientation: Evidence from four countries', *International Entrepreneurship and Management Journal* 11(1), 95–112. <https://doi.org/10.1007/s11365-013-0278-z>
- Gorgievski, M.J., Stephan, U., Laguna, M. & Moriano, J.A., 2018, 'Predicting entrepreneurial career intentions: Values and the theory of planned behavior', *Journal of Career Assessment* 26(3), 457–475. <https://doi.org/10.1177/1069072717714541>
- Grotzinger, A.D., Rhemtulla, M., De Vlaming, R., Ritchie, S.J., Mallard, T.T., Hill, W.D. et al., 2019, 'Genomic structural equation modelling provides insights into the multivariate genetic architecture of complex traits', *Nature Human Behaviour* 3(5), 513–525.
- Harman, H.H., 1976, *Modern factor analysis*, 3rd edn., The University of Chicago Press, Chicago, IL.
- Ibrahim, N. & Mas'ud, A., 2016, 'Moderating role of entrepreneurial orientation on the relationship between entrepreneurial skills, environmental factors and entrepreneurial intention: A PLS approach', *Management Science Letters* 6(3), 225–236. <https://doi.org/10.5267/j.msl.2016.1.005>
- Jegade, O. & Nieuwenhuizen, C., 2021, 'Effects of entrepreneurial orientation and external business environment on entrepreneurial intentions of STEM students in Nigeria', *Journal of Contemporary Management* 18(2), 42–66. <https://doi.org/10.35683/jcm21026.119>
- Jiang, F., Wang, G. & Jiang, X., 2019, 'Entrepreneurial orientation and organizational knowledge creation: A configurational approach', *Asia Pacific Journal of Management* 36(4), 1193–1219. <https://doi.org/10.1007/s10490-018-9609-5>
- Jin, H. & Hurd, F., 2018, 'Exploring the impact of digital platforms on SME internationalization: New Zealand SMEs use of the Alibaba platform for Chinese market entry', *Journal of Asia-Pacific Business* 19(2), 72–95. <https://doi.org/10.1080/10599231.2018.1453743>
- Kline, R.B., 2015, *Principles and practice of structural equation modeling*, Guilford Publications, New York, NY.
- Koe, W.L., 2016, 'The relationship between individual entrepreneurial orientation (IEO) and entrepreneurial intention', *Journal of Global Entrepreneurship Research* 6(1), 1–11. <https://doi.org/10.1186/s40497-016-0057-8>
- Kraus, S., Breier, M., Jones, P. & Hughes, M., 2019, 'Individual entrepreneurial orientation and intrapreneurship in the public sector', *International Entrepreneurship and Management Journal* 15, 1247–1268.
- Kreitner, A. & Kinicki, R., 2009, *Organisational behaviour key concept and skills and best practices*, McGraw-Hill, New York, NY.
- Lee, W. & Black, S.L., 2017, 'Small business development: Immigrants' access to loan capital', *Journal of Small Business & Entrepreneurship* 29(3), 193–209. <https://doi.org/10.1080/08276331.2017.1297106>
- Li, J., Yang, F., Qi, J., Sun, R. & Geng, R., 2022, 'The influence of job satisfaction on entrepreneurial intention: A cross-level investigation', *International Small Business Journal* 40(3), 385–402. <https://doi.org/10.1177/02662426211018831>
- Lisboa, A., Skarmeas, D. & Saridakis, C., 2016, 'Entrepreneurial orientation pathways to performance: A fuzzy-set analysis', *Journal of Business Research* 69(4), 1319–1324. <https://doi.org/10.1016/j.jbusres.2015.10.099>
- Liu, Z., Xu, Z., Zhou, Z. & Li, Y., 2019, 'Buddhist entrepreneurs and new venture performance: The mediating role of entrepreneurial risk-taking', *Small Business Economics* 52, 713–727.
- Mandongwe, L. & Jaravaza, D.C., 2020, 'Women entrepreneurial intentions in subsistence marketplaces: The role of entrepreneurial orientation and demographic profiles in Zimbabwe', *Cogent Business & Management* 7(1), 1818365. <https://doi.org/10.1080/23311975.2020.1818365>
- Meoli, A., Fini, R., Sobrero, M. & Wiklund, J., 2020, 'How entrepreneurial intentions influence entrepreneurial career choices: The moderating influence of social context', *Journal of Business Venturing* 35(3), 105982. <https://doi.org/10.1016/j.jbusvent.2019.105982>
- Miaomiao, Y. & Xiaoyan, Z., 2019, 'A study of college students' entrepreneurial capability promotion path in China', *Science Research Management* 40(10), 142.
- Nakku, V.B., Agbola, F.W., Miles, M.P. & Mahmood, A., 2020, 'The interrelationship between SME government support programs, entrepreneurial orientation, and performance: A developing economy perspective', *Journal of Small Business Management* 58(1), 2–31. <https://doi.org/10.1080/00472778.2019.1659671>
- Neneh, B.N., Van Zyl, J.H. & Van Noordwyk, A., 2016, 'Gender differences in entrepreneurial orientation and performance: Evidence from South Africa', in *Proceedings of the 28th Annual Conference of the Southern African Institute of Management Scientists*, Pretoria, September 4–7, 2016, pp. 398–414.
- Nguyen, L.T., An, J. & Ngo, L.V., 2020, 'Transforming social capital into performance via entrepreneurial orientation', *Australasian Marketing Journal (AMJ)* 28(4), 209–217. <https://doi.org/10.1016/j.ausmj.2020.03.001>
- Ogunsade, A.I., Obembe, D., Woldesenbet, K. & Kolade, S., 2021, 'Entrepreneurial attitudes among university students: The role of institutional environments and cultural norms', *Entrepreneurship Education* 4(2), 169–190. <https://doi.org/10.1007/s41959-021-00050-y>
- Ojewumi, A.K., Oyeleke, J.T., Agberotimi, F. & Adedayo, O., 2018, 'Obafemi Awolowo University undergraduate students: The influence of gender and self-efficacy on entrepreneurial intentions', *Journal of Pan African Studies* 11(2), 168–186.
- Ojewumi, K.A. & Fagbenro, D.A., 2019, 'Entrepreneurial intention among polytechnic students in Nigeria: The role of self-efficacy and social networks', *International Journal of Entrepreneurial Knowledge* 7(1), 20–30. <https://doi.org/10.37335/ijekv7i1.85>
- Okoye, N., 2016, 'The Central Bank of Nigeria competency framework for the Nigerian banking industry: A case of "near" adequacy', *Journal of International Banking Law and Regulation* 31(1), 44–51.
- Ondimu, D.O., Kikui, G.M. & Otieno, W.N., 2019, 'Risk factors for hypertension among young adults (18–35) years attending in Tenwek Mission Hospital, Bomet County, Kenya in 2018', *The Pan African Medical Journal* 33, 210. <https://doi.org/10.11604/pamj.2019.33.210.18407>
- Owoseni, A. & Twinomurizi, H., 2019, 'The dynamic capabilities of small and medium-scale enterprises using mobile apps in Lagos, Nigeria', *The Electronic Journal of Information Systems in Developing Countries* 85(1), e12061. <https://doi.org/10.1002/isd2.12061>
- Primahendra, R., Purba, J.T., Ugut, G.S.S. & Budiono, S., 2021, 'Do digital literacy and digital entrepreneurship among university students contribute to digital economy?', *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences* 4(3), 7387–7394.
- Rambe, P., Ndofirepi, T. & Dzansi, D., 2016, 'Technological creativity and its influence on entrepreneurship intentions of vocational education students', in *Conference: Proceedings of the 11th European Conference on Innovation and Entrepreneurship*, The JAMK University of Applied Science Jyväskylä, Finland, September 15–16, 2016, pp. 602–610.
- Ratnaningtyas, S., Sutardi, A. & Makbul, Y., 2018, 'The influence of entrepreneurship capability to micro and small business growth in Indonesian fish processing industry', *International Journal of Engineering & Technology* 7(3), 100–105. <https://doi.org/10.14419/ijet.v7i3.25.17476>
- Rosin, A.F., Proksch, D., Stubner, S. & Pinkwart, A., 2020, 'Digital new ventures: Assessing the benefits of digitalization in entrepreneurship', *Journal of Small Business Strategy* 30(2), 59–71.
- Shekarian, M. & Parast, M., 2021, 'Do entrepreneurship skills improve project performance? A project-based learning perspective', *The Journal of Entrepreneurship* 30(2), 267–305. <https://doi.org/10.1177/09713557211025653>
- Song, S.I., Thominathan, S. & Khalid, N.A., 2021, 'Entrepreneurial intention of UITM students and the mediating role of entrepreneurship education', *Asian Journal of University Education (AJUE)* 7(2), 236–251. <https://doi.org/10.24191/ajue.v7i2.13405>
- South African Government, 2019, *White paper on science, technology and innovation*, viewed 01 March 2019, from <https://www.gov.za/documents/white-paper-science-technology-and-innovation-0000>.
- Suartha, N. & Suprpti, N.W.S., 2016, 'Entrepreneurship for students: The relationship between individual entrepreneurial orientation and entrepreneurial intention', *European Journal of Business and Management* 8(11), 45–52.
- Van Trang, T., Do, Q.H. & Luong, M.H., 2019, 'Entrepreneurial human capital, role models, and fear of failure and start-up perception of feasibility among adults in Vietnam', *International Journal of Engineering Business Management* 11, 1847979019873269. <https://doi.org/10.1177/1847979019873269>
- Wan-Ismael, W.N.A. & Olabinjo, I.A., 2017, 'Entrepreneurial intention and its influence among international students of Universiti Utara Malaysia', *Journal of Advanced Research in Business, Marketing, and Supply Chain Management* 1(1), 68–75.
- Yousaf, Z. & Majid, A., 2018, 'Organizational network and strategic business performance: Does organizational flexibility and entrepreneurial orientation really matter?', *Journal of Organizational Change Management* 31(2), 268–285. <https://doi.org/10.1108/JOCM-12-2016-0298>
- Youssef, A.B., Boubaker, S., Dedaj, B. & Carabregu-Vokshi, M., 2021, 'Digitalization of the economy and entrepreneurship intention', *Technological Forecasting and Social Change* 164(5), 120043. <https://doi.org/10.1016/j.techfore.2020.120043>
- Zanella, G., Solano, D.B.C., Hallam, C.R. & Guda, T., 2019, 'The role of the organization in the entrepreneur–opportunity nexus', *International Journal of Entrepreneurial Behavior & Research* 25(7), 15371562. <https://doi.org/10.1108/IJEBR-03-2018-0169>
- Zehir, C., Karaboğa, T. & Başar, D., 2020, 'The transformation of human resource management and its impact on overall business performance: Big data analytics and AI technologies in strategic HRM', in U. Hacıoglu (ed.), *Digital business strategies in blockchain ecosystems*, pp. 265–279, Springer, Cham.