

Innovation conviction, innovation mindset and innovation creed as precursors for the need for achievement and women's entrepreneurial success in South Africa: entrepreneurial education as a moderator

Entrepreneurial
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Abstract

Purpose – This study aims to determine the impact of innovation conviction, innovation mindset and innovation creed on the need for achievement and the success of women entrepreneurs. The study also investigates the impact of entrepreneurial education in moderating the relationship between the need for achievement and women's entrepreneurial success.

Design/methodology/approach – The study used a structured questionnaire and a quantitative research design. Data were gathered from 304 women entrepreneurs in South Africa's Gauteng province. The data were analysed using smart partial least squares.

Findings – The results showed that innovation conviction, innovation mindset and innovation creed have positive and significant impacts on the need for achievement. It was also discovered that the need for achievement and entrepreneurial education have a positive and significant impact on women's entrepreneurial success. Moreover, the results showed that entrepreneurial education had a positive and significant moderating effect on the nexus between the need for achievement and women's entrepreneurial success.

Practical implications – By comprehensively examining the impact of innovation conviction, innovation mindset and innovation creed on the need for achievement and women's entrepreneurial success, this study has valuable implications for academics.

Originality/value – This research will add to the corpus of information on women's entrepreneurship and small business management in Africa, which is generally overlooked by academics in developing countries.

Keywords Innovation conviction, Innovation mindset, Innovation creed, Need for achievement, Women's entrepreneurial success

Paper type Research paper



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Introduction

The development and improvement of entrepreneurial activities in a country cannot be separated from the participation and role of women in these activities (Riandika and Mulyani, 2020). Women's participation in entrepreneurship has increased quite sharply over the past decade (Riandika and Mulyani, 2020), and women's entrepreneurship occurs when women are involved in the innovation of business (Ratten, 2011). While innovation is very important as it influences the success of women entrepreneurs (Lai *et al.*, 2010), the quality of the entrepreneurial activity driven by innovation creates value (Ferraris *et al.*, 2018; Saiz-Alvarez and Martínez, 2019), and entrepreneurship with innovation will help in knowledge development that can be used for entrepreneurship and value co-creation (Nair, 2016). While Popović-Pantić (2014) commented on the lack of sufficient research that focuses on innovations among female entrepreneurs, Ascher (2012) opined that obstacles to women entrepreneurship could be reduced if policy makers frame policies to encourage innovation, creativity and creativity growth.

This study examines the role of innovation conviction (ICN), innovation mindset (IM) and innovation creed (ICD) as key catalysts that stimulate the need for achievement (NFA) and women's entrepreneurial success among women entrepreneurs in South Africa. ICN measures their determinacy of readiness to accept innovation (Kuczmarski, 1996). The conviction to innovate is essential for success, as it will increase the innovation that an entrepreneur introduces into her business (Lai *et al.*, 2010). In addition, this study proposed that looking at the predecessor of the NFA – the IM of women entrepreneurs in small and medium enterprises (SMEs) is vital. An innovative mindset describes all the behaviour by which an individual can influence the innovation process, particularly focusing on behaviour oriented towards generating and applying ideas (De and Den, 2007). From the SMEs' perspective, it has been found that entrepreneurs with an innovative mindset will prioritise innovation as a tool to achieve business success and use strategic management practices and intellectual capital management as opposed to an SME owner-manager who lacks an IM (Volná *et al.*, 2015; Kabonga *et al.*, 2021b). Women entrepreneurs must have an ICD, which is defined by Lai *et al.* (2010) as the female entrepreneur's belief and motivation for increased innovation. Therefore, to make innovation a part of the business practice, women entrepreneurs need to develop the right attitude, conviction and creed in practicing the innovative mind.

It is important to mention that the mechanisms by which these innovation precursors (ICN, IM and ICD) would influence the NFA and women entrepreneurial success are often characterised as tepid and are still in need of enhanced scientific rigour. Furthermore, given the aforementioned importance of ICN, IM and ICD in the NFA and women entrepreneurial success, the dearth of research on these three innovation precursors on the NFA and women's entrepreneurial success relationship is indeed astonishing now, warranting academic scrutiny and empirical inquiry. Perhaps the most compelling argument for investigating the impact of ICN, IM and ICD on the NFA and women entrepreneurial success by this current study derives from the fact that prior studies have been largely conducted in developed countries (Lai *et al.*, 2010). Therefore, little is known of the same from developing parts of the world, such as African countries – South Africa in particular. Hence, this lacuna deserves empirical inspection in the case of a neglected context of women entrepreneurs who manage SMEs in developing countries.

Against the abovementioned backdrop, it is essential to note that there is still a shortage of empirical evidence of relationships between ICN, IM, ICD, the NFA and women's entrepreneurial success. Consequently, further scholarly introspections are considered necessary. Much of what is written on the subject is based on samples from other countries such as Malaysia, Pakistan, Saudi Arabia, Turkey and Singapore (among others). For example, among female entrepreneurs in Malaysia, Lai *et al.* (2010) consider the effect of innovation on the success of female entrepreneurs.

Furthermore, [Zeb and Ihsan \(2020\)](#) explored the impact of entrepreneurship and innovation on the entrepreneurial performance of women-owned small and medium-sized enterprises in Pakistan. [Kemppainen \(2019\)](#) examined success factors for female entrepreneurial innovators in the Kingdom of Saudi Arabia (KSA) context. Additionally, in their study entitled, “*Innovation and Technology-based women entrepreneurs in Turkey*”, [Cansiz and Tekneci \(2018\)](#) explore the association of social, cultural and economic capital with the performance of women entrepreneurs established in Turkey’s technoparks. Moreover, [Subramaniam and Islam \(2014\)](#) examined innovation and the impact of technology on women entrepreneurs in SMEs in Singapore.

Despite the increasing body of innovation research centred on women entrepreneurs, there is still a lack of comprehension of the effect of ICN, IM and ICD on the NFA and women entrepreneurial success. Previous academics have performed their research in different areas within the South African context by concentrating on: the importance of entrepreneurial competencies on the performance of women entrepreneurs in South Africa ([Zizile and Tendai, 2018](#)); challenges faced by women entrepreneurs and strategies adopted by women entrepreneurs to ensure small business success in Nkonkobe Municipality, South Africa ([Agholor et al., 2015](#)); how women entrepreneurs engaged in green entrepreneurship can help build a green economy in South Africa ([Maziriri et al., 2019](#)); measuring the effectiveness of the Women Entrepreneurship Programme on potential, start-up and established women entrepreneurs in South Africa ([Botha et al., 2007](#)); and the information and knowledge society and its impact on poverty alleviation and economic empowerment among informal sector women entrepreneurs in South Africa ([Jiyane, 2012](#)).

While these studies are informative, they did not examine the effect of ICN, IM and ICD on the NFA and women’s entrepreneurial success in South Africa. This article therefore helps to tackle the gap by using a sample of women entrepreneurs from a developing country context. The findings of this study will encourage women entrepreneurs to consider the importance of ICN, IM and ICD in running entrepreneurial ventures, and assist in promoting a women-based entrepreneurial culture in South Africa. It is also important to note that very few (if any) researchers have used structural equation modelling (SEM) to test the relationships of ICN, IM and ICD, the NFA and women’s entrepreneurial success. The exhaustive review of relevant literature opens a gap in research that needs to be addressed. Also, there is limited literature with an integrated approach of various key factors to measure women’s NFA and the entrepreneurial success ([Kabonga et al., 2021a](#)). Hence, this study opens broader dimensions in the form of a validated model depicting the cause–effect relationship of factors, NFA and success. The major gap observed is that there is limited study (conducted in the South African context) related to micro-entrepreneurs in the women entrepreneurship segment, regardless of the government’s constant effort to promote the same. The present study is an attempt to bridge the identified gaps and add to literature in the field of women’s entrepreneurship, suggesting implications for policymakers. With regard to the conceptual model proposed in this study, it can be noted that it is unique – no previous study has tested the variables in the proposed model in relation to the South African context (to the best knowledge of the researcher). Moreover, the moderating role of entrepreneurial education has also been determined by various researchers ([Gupta and Sharma, 2018](#); [Shah et al., 2020](#); [Seyoum et al., 2021](#)), but its role as a moderator between the NFA and entrepreneurial success has not been explored by any study. Hence, this study will be a significant contribution to addressing this gap.

The rest of the article is organised as follows: firstly, the research context is provided, followed by a review of Schumpeter’s theory of innovation and the social cognitive theory. This is followed by a theoretical model and the hypothesis creation. The research design and methodology are then presented, followed by a presentation of the results and the discussions. The final sections of the article discuss the implications, limitations and future research directions.

Research context

The relevance of selecting women entrepreneurs in South Africa

Since few women entrepreneurs are successfully running their small businesses in South Africa, this study focused on determining the factors that can stimulate women entrepreneurial success. It is essential to note that when it comes to South Africa's entrepreneurial landscape, women continue to be under-represented (SME South Africa, 2022). According to a poll done by Facebook in collaboration with the World Bank and the Organisation for Economic Co-operation and Development (OECD), just 34% of SMEs in South Africa are run by women (SME South Africa, 2022). This is despite the fact that more than half of the country's population is female. Therefore, increasing women entrepreneurial activity is imperative, because when women entrepreneurs succeed, they are more likely to invest back into their families and to provide necessary services and opportunities to their communities. The authors of this study decided to determine the impact of ICN, IM and ICD on the NFA and the success of women entrepreneurs. This is because women play a substantial role in growing the economy, and the lagging participation of women in South Africa's economy is manifesting in less innovation (Rachelson, 2019). Hence, this warrants the need of the current scholarly introspection.

Theoretical contributions of the study

The major theoretical contribution of the research study is that it is unique, compared to preceding studies. Thus, the current study significantly extends existing ICN, IM and ICD as precursors for the NFA and women's entrepreneurial success theoretical knowledge, which has not been effectively developed in the context of Southern African region. Firstly, there is scant knowledge about how ICN, IM and ICD affect women entrepreneurs' NFA and their ability to accomplish entrepreneurial success in an African context. Particularly in South Africa, a developing economy that most academic researchers often ignore. Another contribution is in the form of examining the effects of a potential moderator variable on the nature of the relationship between two constructs. In line with this notion, it became apparent that the current theoretical framework applied is more relevant because most of the theories and models from the entrepreneurship literature have a context of the organisations and do not separately focus on women as integral social actors who push the innovation agenda. This enhances theoretical development of the social cognitive theory, which conceives individuals as active agents who contribute to the circumstances surrounding their lives (Bandura, 2018; Wei *et al.*, 2019). Precisely, this study validated the moderating role of entrepreneurial education on the nexus between NFA and women's entrepreneurial success. The absence of moderators from Schumpeter's theory of innovation and the social cognitive theory will aid in the development of theories in this regard.

Practical contributions of the study

Understanding peculiar dimensions of innovation to stimulate the NFA and entrepreneurial success will enable women entrepreneurs to manage their entrepreneurial ventures well. Kloppers (2018) mentioned women enterprises cannot succeed without innovation, and innovation is a success strategy to venture creation, business growth and sustainability. The study offers valuable practical insights on achieving a sustainable ICN, IM and ICD as precursors for the NFA and women's entrepreneurial success. Hence, these factors are deemed to be the mainstay of attention of any entity with an endeavour to instigate the desire for the innovation amongst women in South Africa. From a pragmatic perspective, the statistical results indicate the need to support the vital role of the predictive factors (ICN, IM and ICD) applied in the current model. Women not only learn entrepreneurial skills through entrepreneurial education, but also need to immerse themselves in the entrepreneurial community to improve the discovery of entrepreneurial opportunities. The women's innovative knowledge acquisition and skills development will close the social innovation gaps in most South African rural and urban communities. There is high propensity of long-term economic growth and reduction of social exclusion.

Theoretical lens

Schumpeter's theory of innovation

Schumpeter's theory of innovation provides the theoretical basis of this research study. It was proposed by Joseph Schumpeter in 1928 and suggests that entrepreneurs can create new opportunities for profit through innovative ways (Schumpeter, 1928). Again, in 1934, Schumpeter highlighted the critical role of entrepreneurship in the search for new opportunities for creativity and innovation that incorporate the chance to generate profits (Schumpeter, 1934). Loh and Dahesihari (2013) highlight Schumpeter's theory regarding entrepreneurship as being intuitive and innovative – to perform activities without being over-analytical, creative, inventive and to have the ability to overcome self-doubt, to conquer uncertainty and manage unfavourable surroundings. Porter (1992) supported Schumpeter's theory by stating that innovation is crucial for the long-run growth of small enterprises, especially in the current global competitive business environment. A study by Tripathi (2005, p. 1) highlighted that Schumpeter regards a woman entrepreneur as an innovator and initiator, and concludes: "women entrepreneurs are those women who initiate, organise and operate business enterprise and want to prove their mettle in innovative and competitive jobs. She also wants to oversee and control every aspect of her business for its overall success". Scholars such as Murphy (2010) and Orwa (2021) aver that Schumpeterian innovation theory has the potential of expounding on the innovation concept, leading to growth among SMEs like women's enterprises. The Schumpeter theory of innovation helped anchor the adoption of ICN, IM and ICD as vital entrepreneurial precursors that stimulate the NFA and the success of women's enterprises in South Africa.

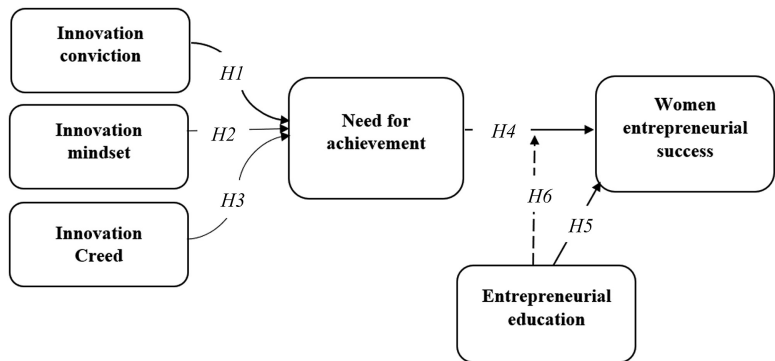
Social cognitive theory

In line with the research focus, the second theory grounding the study is the social cognitive theory, which conceives individuals as active agents who contribute to the circumstances surrounding their lives (Bandura, 2018; Wei *et al.*, 2019). Women now pursue their goals if they believe their abilities and actions can achieve the desired results (Bandura *et al.*, 2003). Entrepreneurial education helps improve their cognitive skills, through consistently adjusting their thoughts and actions, and leads entrepreneurship to be more directional, coherent and meaningful (Wei *et al.*, 2019). The current study utilises the social cognitive theory to examine ICN, IM and ICD as precursors for the NFA and women's entrepreneurial success, where entrepreneurial education is the moderating variable. Learning from observation (Bandura, 1978) to participation (Sims and Sinclair, 2008; Tavella and Franco, 2015; Wei *et al.*, 2019), in a network (Berkes, 2009; Chen and Chang, 2014), learning is no longer a single behaviour, but is implemented in a complex relationship system. General education targets students' development, and the entrepreneurial curriculum system grounds the foundation for improving women's entrepreneurial ability. Due to this, women's entrepreneurship education might enhance students' confidence that they will be able to solve new and unexpected problems. To fully understand the changes in entrepreneurship education, there is a need to consider the needs and characteristics of women entrepreneurship.

Theoretical model and hypotheses formulation

The study's research model was developed (Figure 1). The theoretical model illustrates the suggested interconnection of five constructs: ICN, IM, ICD, NFA and women's entrepreneurial success. The relationships between the proposed constructs in the theoretical model are as follows: ICN, IM and ICD provide the starting point of the model and directly affect the NFA use, which, in turn, induces women's entrepreneurial success. The following sections review the literature on the study's main variables. Moreover, the hypotheses between the study

Figure 1.
Theoretical model



Source(s): Author's construction, based on literature review

variables are discussed in the subsequent sections based on past studies and logically derived from prior results.

Main effects

Innovation conviction and need for achievement (NFA)

ICN is regarded as an attitude that relatively materialises its sincerity in conveying commitment (Lai *et al.*, 2010). The conviction of a female entrepreneur is regarded as her attitude toward innovation (Lai *et al.*, 2010). Some may take conviction lightly, while others may do the opposite. If female entrepreneurs are not convinced to improve themselves through innovation, then how do they survive? This hypothesis is therefore designed to measure their readiness to innovate and succeed, and this study hypothesises that:

H1. ICN has a significant association with NFA.

Innovation mindset and need for achievement (NFA)

Before female entrepreneurs have ICN, their mindset must be aligned. Alwi *et al.* (2018) defined innovative mindset as a way of thinking that influences how an individual views a situation – acting upon this situation reflects his attitude towards innovation. Innovation is a question of mindset, and creating that mindset precedes everything else. The innovative mindset overrides the aspects of human nature that often hold back innovation in an entrepreneur (Volná *et al.*, 2015). Studies reveal that behaviour can drive a performance, but a mindset is more powerful since it actually drives individual behaviour to either increase or decrease performance (Alwi *et al.*, 2018). An innovative mindset describes all the behaviours by which an individual can influence the innovation process, particularly focusing on behaviours oriented towards generating and applying ideas (De and Den, 2007). From the SMEs' perspective, it has been found that entrepreneurs with an innovative mindset will prioritise innovation as a tool to achieve business success and use strategic management practices and intellectual capital management, as opposed to an SME owner-manager who lacks an innovative mindset (Volná *et al.*, 2015). Deducing from the aforementioned elucidation, it can be stated that mindset is a positive attitude that drives businesses, and female entrepreneurs must develop positive behaviour that leads their employees creatively to create new strategies, product features and service characteristics. With a positive attitude, female entrepreneurs can gain rightful respect, eventually leading them to successful businesses. Hence, it would be interesting to find out whether a positive attitude can lead

to IM and their need for success. Consequently, drawing from the above discussion and past empirical evidence, the current study hypothesises that:

H2. IM has a significant association with NFA.

Innovation creed and need for achievement (NFA)

The same applies to *H3*, as conviction is responsible for the success of female entrepreneurs by gradually increasing the level of readiness to accept innovation. However, conviction alone is insufficient because female entrepreneurs require some push factor, such as motivation, to evoke their conviction toward innovation and success. *Kuczmariski (1996)* claims that conviction can be enhanced through beliefs. Therefore, the researcher assumed that if the female entrepreneurs have a belief in innovation, they should utilise this belief to make their company successful as well. As a result, the current study hypothesises that:

H3. ICD has a significant association with NFA.

Need for achievement and women's entrepreneurial success

A person with an NFA refers to one who prefers a moderately difficult task, accepts responsibility and looks for the outcomes (*Rauch and Frese, 2000; Abd Rani and Hashim, 2015*). *Nurwahida (2007)* claimed that most successful women entrepreneurs have an NFA (compared to other characteristics). Besides risk-taking and locus of control, the NFA is one of the important characteristics, as *Rasheed (2001)* mentioned. Furthermore, a higher NFA can be found in business founders since it is very important for economic and business growth (*Rasheed, 2001*). This is supported by *White et al. (2008)* who mentioned that the achievement behaviour not only encourages the entrepreneurs to succeed, but also avoids failure.

H4. There is a relationship between NFA and women's entrepreneurial success.

Entrepreneurial education and women's entrepreneurial success

Entrepreneurship education is important for the socio-economic landscape since it can help equip people and change their attitudes towards becoming entrepreneurs (*Kyari, 2020; Adi et al., 2019; Barucha, 2019*). School education is a primary source of entrepreneurial knowledge and skills. It improves an individual's quality of entrepreneurship and is a key factor in entrepreneurial success (*Galloway and Brown, 2002*). Entrepreneurial education can aid in developing entrepreneurial knowledge and skills, as well as the success of a business (*Liu et al., 2019*). Obtaining the necessary education aids women in locating sources of new ideas and turning these ideas into businesses (*Bhardwaj, 2014*). Moreover, *Schneider et al. (2017)* propose that education and training can improve the entrepreneurial success of women entrepreneurs. Drawing from the aforesaid clarifications, the following hypothesis is presented:

H5. There is a relationship between entrepreneurial education and women's entrepreneurial success.

Moderating effect

Apart from the posited relationships depicted in the conceptual model, direct and indirect relationships between the variables under investigation are plausible. This is why, *Figure 1* incorporates entrepreneurial education as a moderating variable. Although the hypothesis statements (*H1, H2, H3* and *H4*) established basic linkages between the research variables, a better understanding of these complex relationships could shed light on this phenomenon. Several works consider entrepreneurial education as a moderator variable. For instance,

Gupta and Sharma (2018) empirically examined the moderating effect of entrepreneurial education on the relationship between entrepreneurial characteristics and entrepreneurial intention. In addition, Shah *et al.* (2020) determined that entrepreneurial education moderates the relationship between personal attitude, self-efficacy, subjective norms and intention toward entrepreneurship. Moreover, Seyoum *et al.* (2021) established the moderating effects of entrepreneurial education on the relationship between social support and social entrepreneurial intention.

Drawing from above, as much as studies have examined the moderating role of entrepreneurial education, it is, however, important to mention that there have been no accurate empirical estimates of how entrepreneurial education may influence women's entrepreneurial success in ways that go beyond linear relationships. This leads to the following research question:

RQ1. Does entrepreneurial education moderate the relationship between NFA and women's entrepreneurial success?

By addressing this research question, a better theoretical understanding is gained of the relationship between the NFA and women's entrepreneurial success, and some empirical insights are provided into whether entrepreneurial education moderately influences this relationship. Therefore, based on the previous elucidations, the following hypothesis is proposed:

H6. Entrepreneurial education positively and significantly moderates the relationship between NFA and women's entrepreneurial success.

Methodological aspects

This study is based on a positivism philosophy, using a quantitative approach. It uses a deductive approach where the hypothesis is deduced from theory and then expressed in operational terms – a large number of samples are drawn and tested, and the hypothesis is then accepted or rejected. If required, modification is made in the theory. The quantitative research design was appropriate for requesting the necessary data on ICN, IM, ICD, NFA and women's entrepreneurial success. Furthermore, the strategy allows one to investigate the relationships with the constructs used in the research.

Sample and data collection

The population in this study are women entrepreneurs in South Africa. The object area of study is Johannesburg, which is well known for its SME industry. The sampling technique used in this study is purposive sampling because the following criteria determine the selected respondents: this study is conducted only on women who run their own businesses and property, and women who are involved in SME sector with the criteria in accordance to the South African Law (the National Small Business Act 102 of 1996). Criteria for SMEs in South Africa are: SMEs must employ 50 to 200 people, annual turnover must range from R10m to R40m and total gross asset values must range from R3.75m to R15m. This study was conducted by surveying 304 women entrepreneurs in any field who have run their business for any duration.

Measurement instrument and questionnaire design

The variables under investigation were operationalised from previous studies. Modifications to the scales were made to reflect the study context of women's entrepreneurship. The measurement scales, items used, sources, as well as Cronbach's alpha values for the scales are indicated in Table 1. The scale indicators were affixed to a strongly disagree (1) to strongly agree (5) Likert-scale continuum.

Constructs/references	Instruments	Cronbach's alpha
ICN, as adapted from Lai et al. (2010)	- Personally, successful businesswomen are aware of several other industries that have grown through innovation - Successful businesswomen know that profit margins of existing product lines will continue to fall because of competition - Successful businesswomen have noticed that at least one of their key competitors has successfully increased its competitive advantage through implementation of innovation - Successful businesswomen can reduce cost structures, streamline work force and re-engineer processes	0.637
IM, as adapted from Lai et al. (2010)	- Successful businesswomen will use innovation and launch new products that accelerate their company's value - Successful businesswomen will conduct consumer research studies prior to idea generation for proper problems and needs identification - Successful businesswomen listen to others within the organisation who talk about their positive, enthusiastic, supportive and "can-do" attitude towards innovation - Successful businesswomen make innovation an attractive career for their employees to pursue	0.785
ICD, as adapted from Lai et al. (2010)	- Successful business women believe that innovative new products and services are integral to the company's future success - Successful businesswomen believe that internal innovation will yield greater returns - Successful businesswomen believe that innovation should be one of the top five priorities and remain on the "to-do" list - Successful businesswomen believe that an effective IM can motivate employees to perform better and be more productive	0.843
NFA, as adapted from Lai et al. (2010)	- Successful businesswomen are able to create profits and increase profits on an annual basis - Successful businesswomen are able to manage and maintain the manpower - Successful businesswomen are able to balance time between their business and personal lives - Successful businesswomen are able to operate business and maintain this in the long term - Successful businesswomen have a well-thought out plan for expanding the business	0.791
Women entrepreneurial success, as adapted from Khan et al. (2021)	- There has been an increase in sales and profitability during the three past years - My business does not have the capacity to develop new products and processes - I do not think that my business will survive and continue its activity forever - I am committed to social responsibility (i.e. employing local nationals) - My business is offering high-quality products and services - More than 50% of the profits are reinvested in the business - Profits of my enterprise tend to increase - The number of employees in my enterprise has started to increase - There has been an increase in sales and profitability during the three past years	0.700

(continued)

Table 1.
Survey instruments

Table 1.

Constructs/references	Instruments	Cronbach's alpha
Entrepreneurial education, as adapted from Duong (2022)	• My school education helped me develop my sense of initiative – a sort of entrepreneurial attitude • My school education helped me to understand the role of entrepreneurs in society better • My school education made me interested in becoming an entrepreneur • My school education gave me skills and know-how that enable me to run a business • My school education has equipped me with the necessary abilities and expertise to start my own business	0.793

Respondent profile

Table 2 shows the participants' representation. The respondents were asked to report their demographic information, including age, highest level of education, whether the business is a family business, number of years in business and area in which the business situated. The sample comprised 304 female respondents who are entrepreneurs and readily available to participate in the study. Most of these respondents were between the ages of 31–39 (31.9%), followed closely by those between 50 and 59 (31.6%). The third largest age cohort were respondents falling between the ages of 40–49 (18.4%), while the respondents in the age groups 18–30 (12.2%) and 60 and older (5.9%) make up the remainder of the total age groups. The study also aimed to discover whether the businesses run by women entrepreneurs are family businesses. Table 2 indicates that more than half of these respondents (64.1%) do not run a family business, while the rest disclosed that they do run a family business (35.9%). In the survey, respondents were asked to indicate the number of years they have been operating their respective businesses. Interestingly, 52.3% of respondents indicated that they had been in operation for 11–20 years. In addition, 39.5% indicated 4–6 years, while 5.3% indicated 7–10 years, and 3.0% indicated 1–3 years. The businesses were located between the Central Business District (CBD) and industrial areas. In Table 2, the results show that a majority (74.0%) of the respondents have businesses situated in industrial areas, while the remaining participants (26.0%) have businesses in the CBD.

Table 2.
Sample demographic
characteristics
(*n* = 304)

Demographic	Variables	Frequency (<i>n</i>)	Percentage (%)
Age	18–30	37	12.2
	31–39	97	31.9
	40–49	56	18.4
	50–59	96	31.6
	60+	18	5.9
Is this a family business?	Yes	109	35.9
	No	195	64.1
How long have you been in business?	1–3 years	9	3.0
	4–6 years	120	39.5
	7–10 years	16	5.3
	11–20 years	159	52.3
In which area is your business situated?	CBD	79	26.0
	Industrial	225	74.0

Statistical analysis procedure

The investigator used the Statistical Package for Social Science (SPSS) version 26 to evaluate the data pertaining to the demographic profile of the respondents, while the latest software version of SMART-PLS 3.2.7 was used to analyse the data captured. Partial least squares SEM (PLS-SEM) was preferred to covariance-based SEM (CB-SEM) because of its improved statistical power in parameter estimates and the maximisation of understood variance (Tajvidi *et al.*, 2018). Less compatible than competitive relatives are PLS-SEM and CB-SEM (Sarstedt *et al.*, 2014; Rigdon *et al.*, 2010). Nevertheless, PLS-SEM was originally known for its higher prediction over CB-SEM (Hair *et al.*, 2017), although the approximate gaps between the two techniques are quite different. PLS-SEM is analogous to a multiple regression analysis and is considered suitable for simultaneous estimation of relationships between one or more independent and dependent variables. This feature makes PLS-SEM especially valuable for research purposes in exploration (Henseler, 2017). PLS-SEM incorporates path coefficients, multi-linear regression and confirmatory factor analysis (CFA), a second-generation multivariate research technique. This describes the variability in dependent variables by using structural template analysis (Hair *et al.*, 2017, 2011). PLS-SEM works for complex models involving moderation and small samples, and is less prone to ordinary multivariate data (Vlajčić *et al.*, 2019). This research study adopted a reflective measurement model in which measurements represent latent variables and the direction of the connection is from the construct or latent variable to the measure (Diamantopoulos and Winklhofer, 2001). The statistical analysis performed in this study includes measures such as: (1) measurement model – testing of reliability analysis and validity analysis and (2) structural model analysis – examining the path coefficients between observed coefficients.

Reliability analysis. Table 3 specifies the different measures that were used to assess the reliability and validity of the constructs for the study.

Measurement model assessment. The outer model was assessed first by values of composite reliability (CR) (to assess internal consistency), outer loadings (to assess indicator reliability) and average variance extracted (AVE) (to assess convergent validity). CR is an appropriate measure of internal consistency reliability because it accounts for the different outer loadings of the indicator variable. By contrast, Cronbach's alpha assumes all indicators to be equally reliable (Hair *et al.*, 2017). For all the research constructs, the lowest value for each respective item load is 0.520. All individual item loadings consequently surpassed the recommended value of 0.5 (Anderson and Gerbing, 1988). This shows that all measuring instruments are satisfactory and reliable as all items showed convergent validity, with more than 50% of the variance of each item shared with their respective construct (Fraering and Minor, 2006). As shown in Table 2, the Cronbach's alpha test results ranged between 0.701 and 0.861, which is above the 0.70 benchmark for acceptable internal consistency reliability (Field, 2013).

As revealed in Table 3 results, the lowest CR value of 0.807 is well above the suggested value of 0.6 (Hulland, 1999), while the lowest obtained AVE value of 0.476 is also above the recommended value of 0.4 (Anderson and Gerbing, 1988). This shows the accomplishment of convergent validity, and further confirms the excellent internal consistency and reliability of the measuring instruments used. As such, a sufficient level of discriminating validity was revealed by all the variables. These results have generally provided evidence of acceptable levels of reliability of the research scale (Chinomona and Chinomona, 2013). Field (2013) states that discriminant validity refers to items measuring different concepts. Table 4 presents the results of the discriminant validity analysis.

In terms of discriminant validity, all the correlation coefficients of this study fell below 0.70, thereby confirming the theoretical uniqueness of each variable in this research (Field, 2013). In addition, discriminant validity was evaluated using the heterotrait-monotrait ratio (HTMT) criterion (Table 4), despite recommendations from previous studies (Henseler *et al.*,

Table 3.
Scale accuracy
analysis

Research constructs	Variable	Mean value	Scale mean	SD	Scale SD	Cronbach's test Item total α	CR	AVE	Factor loadings	VIF (outer) values
IC	–	–	4.695	–	1.236	–	0.807	0.517	–	–
	IC1	4.728	–	1.314	–	0.665	–	–	0.520	1.926
	IC2	4.630	–	1.224	–	0.612	–	–	0.794	1.945
	IC3	4.719	–	1.160	–	0.687	–	–	0.780	1.956
	IC4	3.963	–	1.327	–	0.701	–	–	0.746	1.987
IM	–	–	4.105	–	1.197	–	0.865	0.617	–	–
	IM1	4.613	–	1.094	–	0.588	–	–	0.864	2.008
	IM2	4.251	–	1.398	–	0.621	–	–	0.850	2.061
	IM3	4.369	–	1.232	–	0.634	–	–	0.668	1.987
	IM4	4.547	–	1.180	–	0.656	–	–	0.743	1.945
ICR	–	–	4.230	–	1.450	–	0.855	0.599	–	–
	ICR1	3.928	–	1.477	–	0.572	–	–	0.621	1.524
	ICR2	4.101	–	1.498	–	0.589	–	–	0.855	1.570
	ICR3	3.713	–	1.593	–	0.688	–	–	0.838	1.745
	ICR4	4.195	–	1.625	–	0.697	–	–	0.759	1.926
NFA	–	–	4.456	–	1.462	–	0.857	0.636	–	–
	NFA1	4.582	–	1.213	–	0.716	–	–	0.804	1.923
	NFA2	4.748	–	1.235	–	0.755	–	–	0.840	1.892
	NFA3	4.630	–	1.227	–	0.752	–	–	0.777	1.692
	NFA4	4.569	–	1.317	–	0.582	–	–	0.810	1.772
WES	NFA5	4.826	–	1.333	–	0.521	–	–	0.753	1.798
	–	–	4.351	–	1.321	–	0.890	0.476	–	–
	WES1	3.513	–	1.261	–	0.721	–	–	0.681	1.334
	WES2	3.822	–	1.168	–	0.737	–	–	0.728	1.432
	WES3	3.921	–	1.188	–	0.734	–	–	0.694	1.338
EED	WES4	4.102	–	1.168	–	0.773	–	–	0.707	1.785
	WES5	4.231	–	1.398	–	0.756	–	–	0.706	1.553
	WES6	4.331	–	1.232	–	0.768	–	–	0.647	1.567
	WES7	4.356	–	1.163	–	0.703	–	–	0.550	1.633
	WES8	4.394	–	1.075	–	0.845	–	–	0.796	1.672
EED	WES9	4.413	–	1.328	–	0.869	–	–	0.673	1.983
	–	–	3.497	–	1.247	–	0.848	0.529	–	–
	EED1	3.670	–	1.188	–	0.734	–	–	0.701	1.987
	EED2	3.464	–	1.168	–	0.830	–	–	0.843	2.008
	EED3	3.307	–	1.398	–	0.749	–	–	0.749	2.061
EED	EED4	4.547	–	1.232	–	0.816	–	–	0.660	2.642
	EED5	4.631	–	1.251	–	0.826	–	–	0.667	2.724
	–	–	–	–	–	–	–	–	–	–

Note(s): IC = Innovation conviction; IM = Innovation mindset; ICR = Innovation creed; NFA = Need for achievement; WES = Women entrepreneurial success; EED = Entrepreneurial education

2016; Verkijika and De Wet, 2018) indicating that HTMT is more suitable to evaluate discriminant validity than Fornell–Larcker’s commonly used criteria. When taking a more conservative position, discriminant validity is reached when the HTMT value is below 0.9 or 0.85 (Verkijika and De Wet, 2018; Neneh, 2019). Table 4 reveals that the highest obtained HTMT value is 0.841, which is below the conservative value of 0.85. As such, all the constructs meet the criteria for discriminant validity.

Structural model assessment. Inner model structural model (Figure 2) was assessed to test the relationship between the endogenous and exogenous variables. The path coefficients were obtained by applying a non-parametric, bootstrapping routine (Chin and Dibbern, 2010), with 261 cases and 5,000 samples for the non-return model (two-tailed; 0.05 significance level; no sign changes). The fitness of the model was assessed using the standardised root mean square residual (SRMR), based on the criteria that a good model should have an SRMR value < 0.08 (Henseler *et al.*, 2016). The structural model in Figure 2 had an SRMR of 0.057, thus suggesting an adequate level of model fitness. In the model, the two endogenous variables (NFA and women’s entrepreneurial success) had R^2 values of 0.561 and 0.651, respectively, suggesting sufficient predictive accuracy of the structural model (Figure 2).

Assessment of the goodness of fit (GoF). Overall, R^2 for NFA and women’s entrepreneurial success in Figure 2 indicates that the research model explains 56.1 and 65.1%, respectively, of the variance in the endogenous variables. Using the following formulae, given by Tenenhaus *et al.* (2005), the global goodness of fit (GoF) statistic for the research model was calculated using the equation:

$$\begin{aligned}\text{Goodness of Fit} &= \sqrt{\left(\text{average of all AVEs values} * \text{average of all } R^2\right)} \\ &= \sqrt{0.562 * 0.606} \\ &= 0.58\end{aligned}$$

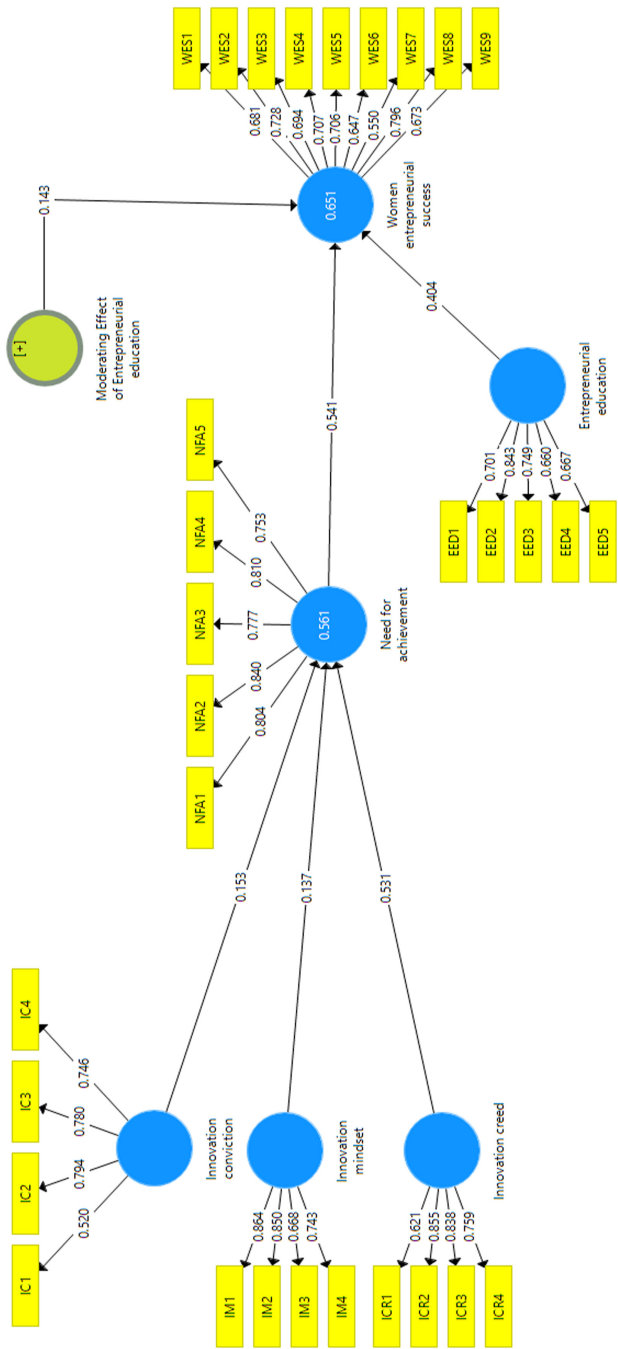
where AVE represents the average of all AVE values for the research variables, while R^2 represents the average of all R^2 values in the full path model. The calculated global GoF is 0.58, which exceeds the threshold of GoF > 0.36 suggested by Wetzels *et al.* (2009). Therefore, it can be concluded that the research model has a good overall fit.

Multicollinearity assessment of the outer model. For PLS-SEM, common method bias (CMB) is detected through a full collinearity assessment approach (Kock, 2015). The variance inflation factor (VIF) values should be lower than the 3.3 threshold (Hair *et al.*, 2011; Kock, 2015). This is indicative that the model is free from CMB. Any value greater than 3.3 means the model is affected by CMB. Thereafter, on following standard procedures in business research, the VIF values were computed *in lieu* of reporting the collinearity issues in this work. The SMART PLS 3 output reports the following: VIF (outer) values for ICN

Variables	IC	IM	ICR	NFA	WES	EED
IC	1.000	–	–	–	–	–
IM	0.461	1.000	–	–	–	–
ICR	0.563	0.822	1.000	–	–	–
NFA	0.537	0.810	0.487	1.000	–	–
WES	0.471	0.694	0.552	0.457	1.000	–
EED	0.708	0.841	0.563	0.581	0.632	1.000

Note(s): HTMT = Heterotrait-monotrait ratio, IC = Innovation conviction; IM = Innovation mindset; ICR = Innovation creed; NFA = Need for achievement; WES = Women entrepreneurial success; EED = Entrepreneurial education

Table 4.
Discriminant
validity (HTMT)



Source(s): Calculated from survey results

Figure 2.
Structural model

(1.926–1.987), IM (1.945–2.061), ICD (1.524–1.926), NFA (1.692–1.923), women's entrepreneurial success (1.334–1.983) and for entrepreneurial education (1.987–2.724).

Path model. The PLS estimation path coefficients values and the item loadings for the research construct, are shown in [Figure 2](#).

Outcome of hypotheses testing

In this study, hypotheses testing was conducted by path coefficient values, as well as the *t*-values for the structural model obtained from the bootstrapping algorithm. According to [Beneke and Blampied \(2012\)](#), *t*-values indicate whether a significant relationship exists between variables in the model and path coefficients, demonstrating the strength of the relationships in the model. [Figure 2](#) and [Table 5](#) show the standardised path coefficients and their corresponding *t*-values. A statistically significant relationship is expected to have a *t*-value that exceeds 1.96 at a 5% level of significance ([Chin, 1998](#)).

Outcome of testing hypothesis 1: Innovation conviction and need for achievement. The primary hypothesis expresses that ICN positively and significantly impacts the NFA. In this examination, this assumption was reinforced. It can be seen in [Figure 2](#) and [Table 5](#) that ICN had a positive impact ($\beta = 0.153$) and was statistically significant ($t = 2.137$) in predicting the NFA. This outcome proposes that the higher the level of ICN, the higher the level of NFA. Along these lines, this examination fails to dismiss [H1](#).

Outcome of testing hypothesis 2: Innovation mindset and need for achievement. The second hypothesis states that IM positively and significantly impacts NFA. In this study, this supposition is upheld. It can be seen in [Figure 2](#) and [Table 5](#) that IM exerts a positive influence ($\beta = 0.137$) and was measurably significant ($t = 1.971$) in predicting the NFA. This outcome endorses that the higher the level of IM, the higher the level of NFA. Consequently, this investigation supports [H2](#).

Outcome of testing hypothesis 3: Innovation creed and need for achievement. The third hypothesis states that ICD positively and significantly impacts the NFA. In this examination, this hypothesis is upheld. [Figure 2](#) and [Table 5](#) indicate that ICD exerts a positive impact ($\beta = 0.531$) and is significant ($t = 7.841$) in influencing the NFA. This outcome claims that the higher the level of ICD, the higher the NFA. Thus, this examination supports [H3](#).

Outcome of testing hypothesis 4: Need for achievement and women's entrepreneurial success. The fourth hypothesis states that the NFA positively and significantly impacts women's entrepreneurial success. This study supports the hypothesis. It can be observed in [Figure 2](#) and [Table 5](#) that the NFA exerts a positive influence ($\beta = 0.541$) and is statistically significant ($t = 9.624$) in predicting women's entrepreneurial success. This result suggests

Hypothesis	Proposed hypothesis relationship	Beta coefficients (β)	<i>t</i> -statistics	<i>p</i> -values	Decision
H1	IC → NFA	0.153	2.137	0.003	Supported
H2	IM → NFA	0.137	1.971	0.031	Supported
H3	ICR → NFA	0.531	7.841	0.000	Supported
H4	NFA → WES	0.541	9.624	0.000	Supported
H5	EED → WES	0.404	5.573	0.000	Supported
H6	NFA*EED → WES	0.143	1.975	0.027	Supported
Moderating effect					

Note(s): Arrows signify the relationships between each construct to indicate the proposed hypothesis

Source(s): Calculated from survey results

Table 5.
Results of structural
equation model
analysis

that the higher the level of NFA, the higher the level of women’s entrepreneurial success. Along these lines, this examination fails to dismiss H4.

Outcome of testing hypothesis 5: Entrepreneurial education and women’s entrepreneurial success. The fifth hypothesis states that entrepreneurial education positively and significantly impacts women’s entrepreneurial success. This study supports the hypothesis. It can be observed in Figure 2 and Table 5 that the entrepreneurial education exerts a positive influence ($\beta = 0.404$) and is statistically significant ($t = 5.573$) in predicting women’s entrepreneurial success. This result suggests that the higher the level of NFA, the higher the level of women’s entrepreneurial success. Along these lines, this examination fails to dismiss H5.

Outcome of testing hypothesis 6 (testing the moderation effect): Need for achievement, entrepreneurial education and women’s entrepreneurial success. To assess the moderating role of entrepreneurial education, this study used a product indicator method (PIM) using PLS-SEM (Chin, 2010). PIM was used because the suggested moderating construct was continuous (Rigdon et al., 2017). Cohen’s (1988) rules were used to assess the moderating effects. Regarding H6 (entrepreneurial education moderates the NFA – women’s entrepreneurial success relationship), the interaction terms ($\beta = 0.143$, $p = 0.027$) were significant (Table 5, Figure 2). Hence, H6 was supported. The interaction plot in Figure 3 presents a better understanding of this association. The slope for the link between entrepreneurial education and women’s entrepreneurial success moderated by entrepreneurial education showed that the relationship became stronger when there was high entrepreneurial education (Figure 3). More specifically, as illustrated in Figure 3, when entrepreneurial education is high, the impact of the NFA on women’s entrepreneurial success tends to be stronger. Figure 3 shows that women’s entrepreneurial success increases with an increase in the NFA. However, the increase is more pronounced for individuals (women entrepreneurs) with a high level of entrepreneurial education compared to those with a low level of entrepreneurial education.

Discussion of results

The statistical analysis exposed that ICN positively and significantly affects the NFA. This finding has ample support from previous empirical research studies, such as that conducted by Lai et al. (2010), who discovered that ICN positively predicts the NFA. The findings of this study also authenticate the existence of a positive connection between IM and the NFA. The results obtained in the current study are also not without empirical support. For instance, Volná et al., 2015 found that an IM was associated with the NFA. Empirical evidence was also found in this research that confirmed there is a positive association between ICD and the

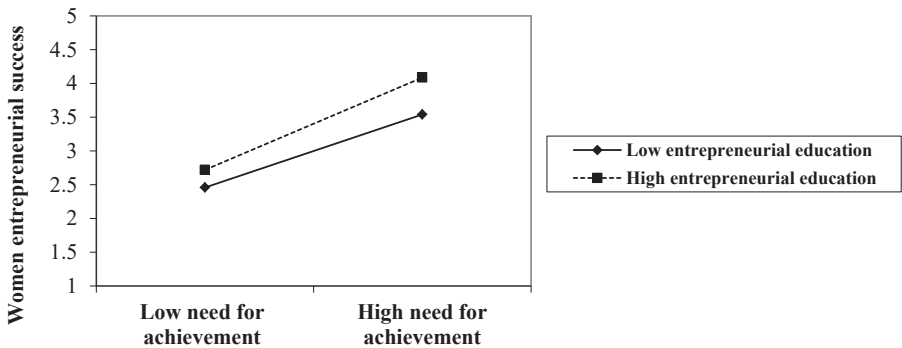


Figure 3.
Moderation effect

NFA. These results are in line with the works of [Lai *et al.* \(2010\)](#), who discovered that ICD has a significant association with the NFA. It was also discovered that the NFA positively and significantly impacts women's entrepreneurial success. The results obtained in the current study concur with literature. For instance, [Nurwahida \(2007\)](#) claimed that most successful women entrepreneurs have the characteristics of the NFA compared to other characteristics.

This study also discovered that entrepreneurial education is instrumental in determining women's entrepreneurial success. These findings mirror the work of [Schneider *et al.* \(2017\)](#). The authors proposed that education and training can improve the entrepreneurial success of women entrepreneurs. Moreover, the statistical analysis showed that entrepreneurial education moderates or strengthens the relationship between the NFA and women's entrepreneurial success. This finding aligns with various international studies ([Gupta and Sharma, 2018](#); [Shah *et al.*, 2020](#); [Seyoum *et al.*, 2021](#)) that have determined the moderating effect of the entrepreneurial education variable in different contexts. As there are gaps in research on the moderating effect of entrepreneurial education on the nexus between the NFA and women's entrepreneurial success, this study adds a fresh understanding or adds new theoretical knowledge by broadening our understanding of entrepreneurial education as a factor that can stimulate the NFA of women entrepreneurs. Understanding how the moderating variable (entrepreneurial education) interacts with the nexus between the NFA and women's entrepreneurial success is important. For instance, the practical implication of the findings of the study is that if women entrepreneurs are equipped with entrepreneurial skills and knowledge, they have a strong desire to accomplish large entrepreneurial endeavours, and they will be more likely to succeed and establish more companies meant to transform the economy of a nation. In sync with the SMEs' perspective, the results show that entrepreneurs with an innovative mindset will prioritise innovation as a tool to achieve business success and use strategic management practices and intellectual capital management as opposed to an SME owner-manager who lacks an IM. This is supported, for example, by the results that show IM exerts a positive influence and was measurably significant in predicting the NFA. This supports the notion that the higher the level of IM, the higher the level of NFA that can be found in SMEs, formal companies and/or organisations. The findings further show that information and knowledge society have impact on poverty alleviation and economic empowerment among the informal sector women entrepreneurs in South Africa, by enhancing their entrepreneurial skills necessary for small businesses incubation and company formation.

Theoretical contributions

The current study suggests that each dimension of innovation, namely, ICD, ICN and IM, exhibits different levels of influence on the NFA and women's entrepreneurial success. A study by [Lai *et al.* \(2010\)](#) also found that female entrepreneurs in Malaysia needed to adopt an innovation culture in their business. Essentially, the findings from the data analysis posit that business owners ought to adopt the right IM and conviction to ensure entrepreneurial success in the workplace. These findings add new information and insights on women entrepreneurs in South Africa.

Practical implications

The findings from this study have practical implications for women entrepreneurs. Adoption of a unique understanding and approach of how women's entrepreneurial education can moderate ICN, IM and ICD as precursors for the NFA and women entrepreneurial success is quite important. Women not only learn entrepreneurial skills through entrepreneurial

education, but also need to immerse themselves in the entrepreneurial community to improve the discovery of entrepreneurial opportunities. ICN, IM and ICD are the major components of entrepreneurial ability for entrepreneurial education. Policymakers seeking to enhance the growth in the number and quality of entrepreneurs can also use this study's results. It is also important that government and policymakers pay attention to the development of women's entrepreneurial education to foster ICN, IM and ICD, and aim for their achievement and entrepreneurial success. The focus of women entrepreneurial education is not on the transfer of theoretical knowledge but based on practical action to improve entrepreneurial professional skills. In addition, the implications for companies must be considered. Taking cognisance of the study's outcomes, it can be noted that for companies to be entrepreneurially successful in the market, managers should possess ICN, IM and ICD. In addition, the study results confirmed the significant and moderating role of entrepreneurial education on the nexus between NFA and women entrepreneurial success. These results imply that if all enterprise staff are to be equipped with entrepreneurship education, this would enhance the entrepreneurial success of SMEs or their entrepreneurial companies. This is because entrepreneurship education is an important way for entrepreneurs to acquire resources, improve innovation ability and innovative personality, and build multi-level learning channels for entrepreneurs through the integration of different knowledge and value systems (Wei *et al.*, 2019).

Limitations and directions for future research

Like any other study, limitations are proven to exist in empirical research. The first caveat was that the study adopted a non-probability convenience sampling technique. Consequently, the results should be interpreted with caution as probability sampling was not considered, which limits the generalisability of the research findings. Another flaw in this study is that it focuses solely on female entrepreneurs in Johannesburg. The sample of study can be deemed to be too narrow; hence, it is recommended that future studies may consider other gender perspectives or to conduct a comparison study between female and male entrepreneurs. Also, the geographical area covered by the study can be said not to represent South Africa, and Africans, in general. The above-mentioned limitations can be said to be of little significance as Johannesburg is considered the economic hub of South Africa and Africa as a whole. Johannesburg is a city that represents a diverse population of the African continent.

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