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Entrepreneurship training: Why trainee selection is as vital as training design and delivery

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Orientation: Entrepreneurship education (EE) and entrepreneurship training (ET) programmes have boomed but many studies have questioned the degree of applied benefits realised from the training.

Research purpose: The purpose of this research was to resolve the weaknesses and inconsistencies found in prior research concerning ET efficacy.

Motivation for the study: This research aimed to reveal more precisely why and how ET is effective.

Research design, approach and method: The study was quantitative and quasi-experimental, and the data were collected in a non-probability purposive sampling strategy from 234 respondents. The eventual sample size was 184 (before) and 184 (after), in a matched-pair sample, based on the number of usable surveys with a response rate of 78.63%. The study statistics included simple regression and multiple-hierarchical regression analyses.

Main findings: Results indicated entrepreneurial self-efficacy (ESE) had a greater direct impact on entrepreneurial competencies ($r = 0.613$) and business management skills ($r = 0.552$) than training design did ($r = 0.471$; $r = 0.400$), respectively. Furthermore, multiple-hierarchical regression showed that ESE mediates the impact of training design on entrepreneurial competencies and business management skills.

Practical/managerial implications: Without high levels of ESE, ET is likely to be ineffective regardless of how well designed or delivered it is, because the trainees' abilities make all the difference. Trainee selection is therefore a key determinant of ET efficacy.

Contribution/value-add: There is an innovative mediation effect of ESE on the impact that ET has on entrepreneurship human capital (EHC). This extends the implication of seminal work on self-efficacy theory into the realm of ET and EHC outcomes.

Keywords: entrepreneurship training; entrepreneurship human capital; training efficacy; training design; entrepreneurial self-efficacy.

Introduction

The entrepreneur has been at the forefront of economic growth and development since the mid-1980s; this is currently reflected in global and national policy interests used to promote entrepreneurship (Ács et al. 2018:2; Hamdan et al. 2022:2). As a result, Valerio, Parton and Robb (2014:ix) have commented that 'entrepreneurship education (EE) and entrepreneurship education training (EET) programmes have mushroomed'. For context, the Global Entrepreneurship Monitor (GEM) reports define entrepreneurship to include the 'expansion of an existing business, by an individual, a team of individuals or an established business' (Bowmaker-Falconer & Herrington 2020:3).

An entrepreneur is an individual who 'sees opportunity in the market, gathers resources, and creates and grows a business venture to meet these needs' (Nieman & Nieuwenhuizen 2014:10). Entrepreneurs, furthermore, create and drive completely new industries such as space exploration, cloud computing, biofuels, online shopping and artificial intelligence (Ács et al. 2018:2). Thus, entrepreneurs are vital to economic growth and development; this includes providing innovations that support societal progress.

Opportunity-driven entrepreneurs are more innovative with higher business success and economic contribution when compared with necessity-driven entrepreneurs, who result from circumstances such as unemployment (Ács et al. 2018:1). Opportunity-driven entrepreneurs can

be supported by institutions to contribute to higher economic growth in developing economies (Urbano et al. 2020:1089). However, lower rates of opportunity-driven entrepreneurship may be caused by developing economies having a lack of well-developed institutions (Hamdan et al. 2022:2). Therefore, based on the aforementioned, the importance and benefits of the entrepreneur and entrepreneurship to the economy and society are well established.

Entrepreneurs perform better if they are skilled with experience, knowledge, competencies and the correct attitude, to start and grow businesses. General human capital includes education, vocational qualifications and work experience. Seminal research has found human capital to have a positive relationship with economic output (Becker 1962; Mincer 1958). More recently, entrepreneurship human capital (EHC) is considered a tool that can be harnessed for economic growth and development by investing in entrepreneurs' skills and qualifications (Daru 2015; Schivardi & Michelacci 2017:3). It was shown that entrepreneurs with postgraduate degrees earn, on average, $100 000 per year more than those with college degrees (Schivardi & Michelacci 2017:3), indicating that further educational qualifications have value for modern-day entrepreneurs. According to Daru (2015:51), human capital consists of four pillars, namely:

- A nation's education – the primary, secondary and tertiary education system
- A nation's health and welfare – childhood to adulthood physical and mental well-being
- Workforce and employment – the experience, talent, knowledge and workforce training
- An enabling environment – the legal framework, infrastructure and factors that enable returns on human capital.

In the context of the study, the third pillar mentioned by Daru (2015:51) indicates that enterprise start-up and growth experience, entrepreneurship knowledge, entrepreneurial competencies and attitude, and vocational training for entrepreneurs are all important. Consequently, entrepreneurship training (ET) is vital to increase entrepreneurship when a positive relationship exists between ET and EHC outcomes. Entrepreneurship human capital is measurable by entrepreneurship skills and competencies, business management skills and economic output, such as business start-up and growth (Daru 2015:51; Unger et al. 2011:350–354). Therefore, a vital argument supporting this research is that ET is necessary to develop and maintain high levels of business start-up and growth, to create wealth, jobs and economic security – otherwise known as EHC (Ács et al. 2018:2; Botha, Van Vuuren & Kunene 2015:55; Daru 2015:51).

However, there exist two problems with ET, namely practical and theoretical. Practically, ET's general vocational training background remains problematic, with low skill transference or application to the workplace (Tonhäuser & Büker 2016:131). Theoretically and methodologically, prior ET research has been reported as having weak research designs and lacking suitable theoretical foundations (Nabi et al. 2017:278; Valerio et al. 2014:25). Structured theoretical underpinnings avoid unqualified research expectations and assumptions (Dele-Ijagbulu 2019:50). Therefore, the actual design of the training is key to this study's purpose, and training design literature advocates that its design must consider individual trainee characteristics, training context and facilitation style (Alvarez, Salas & Garofano 2004:389). Furthermore, the importance of matching training design to trainee needs and the vocational application thereof is well established (Kirkpatrick & Kirkpatrick 2009:3–4).

Training efficacy underpins this study's research objective because, when ET is effective, positive results such as EHC can be expected. Based on this premise, training efficacy theory requires ET programmes to deliver value to all stakeholders, including ET trainees. Entrepreneurs who invest their time in attending should enjoy greater business performance, such as increased profits, after having received training. When considering how many extremely wealthy entrepreneurs have little formal education (Schivardi & Michelacci 2017:1), such as those who have dropped out of school, college or university to pursue their entrepreneurial dreams, an important question comes to the fore: *will further education and training provide value to them?* Perhaps not, as formal education often has little value to aspirant entrepreneurs (Buenstorf, Nielsen & Timmermans 2017:2).

However, as earlier mentioned further education such as postgraduate degrees is positively related to much higher entrepreneurial income (Schivardi & Michelacci 2017:3). This indicates that further education and training, including ET, should have value for modern-day entrepreneurs. Reports do show that increased entrepreneurship knowledge, skills and competencies are associated with ET (Balachandra 2019:72; Gielnik et al. 2016:339), and the positive associations provide the basis for the ongoing investment in ET. However, the justification thereof is without consistent scientific merit. Global reporting indicates a serious lack of evidence that ET consistently achieves applied benefits, such as entrepreneurial competencies and business start-up and growth (Cho & Honorati 2014:110–111; Martin, McNally & Kay 2013:212–213; Rauch & Hulsink 2015:188). In general, Tonhäuser and Büker (2016:131) report that with formalised vocational training, only 10% – 20% of the learnt skills are eventually practised by trainees in the place of application.

This inconsistency may be explained because of trainees. Theoretically, the study's focus is on self-efficacy theory, which in the vocational training context is a trainees' belief in their ability. This influences training outcomes where higher levels of participant self-efficacy increase training successes (Salas et al. 2012:84; St-Jean & Tremblay 2020:4). Bandura (1977, 2007) originally furthered the self-efficacy construct, which is a psychological term rooted in social cognitive learning theory as the belief in one's ability to accomplish a task or achieve an intended result. In the context of

entrepreneurship and ET, entrepreneurial self-efficacy (ESE) is a vital psychological construct that is known to influence entrepreneurial intent, behaviour and subsequent performance of business start-ups and business growth, based on the seminal research of Chen, Greene and Crick (1998:296). The study's focus is subsequently on ET trainees and how their ESE influences ET outcomes.

The study objective is to provide insights into increasing ET efficacy. These insights will lessen the weakness and concern around the value of ET to the stakeholders involved, including trainees of ET. More methodically phrased, the primary study objective is to test for the main effects between ET training design, ESE and EHC. Then, the secondary study objective is focused on ET trainees and will test ESE's (trainee characteristic) moderating and mediating effect on the impact of training design on EHC. This study's unit of analysis is ET programmes. Entrepreneurship training comprises the independent variable (IV) which is training design and the intervening variable (IVV), which is ESE. The dependent variable (DV) is EHC, which is measured through entrepreneurial competencies and business management skills.

The literature

The field of ET is recognised, and several scholars agree that entrepreneurship can be taught (Balachandra 2019:72; Neck & Corbett 2018:10; Valerio et al. 2014:1). Increased entrepreneurship knowledge, skills and competencies are associated with ET and the positive associations provide the basis for ongoing investment in ET (Balachandra 2019:72; Gielnik et al. 2016:339).

The value of entrepreneurship training

The success of ET is defined and measured at both the individual and organisational levels through the resulting entrepreneurial competencies, entrepreneurial attitude and non-cognitive skills, business management skills, innovation, business start-up and growth. These ET outcomes are collectively determined as EHC, according to human capital theory (Becker 1962; Mincer 1958) and more specifically recent developments in EHC literature (Martin et al. 2013; Unger et al. 2011). Valerio et al. (2014:ix) report that EET programmes have proliferated. This ET trend has been developing since the mid-1980s because of the importance of promoting entrepreneurship as a propeller of economic growth and development (Ács, Desai & Klapper 2008:265; Botha et al. 2015:55; Moos 2015:26; Shane 2009:147). This study's review of 17 South African ET programmes has shown that the majority (53%) have entrepreneurship content, whereafter some have management content (29%) and the remaining 18% have an even combination of entrepreneurship and management. This is consistent with the literature because a balance of entrepreneurship and management content is considered necessary for ET efficacy (Botha et al. 2015:63–64; Morris et al. 2013:352).

Furthermore, personal entrepreneurial skills training focused on entrepreneurial behaviours, and the entrepreneurial mindset, such as innovation, identifying and exploiting new opportunities and goal setting, results in significant improvements in the business performance of sales (17%), profits (30%) and innovation (offering new products and services) compared with the control group (Campos et al. 2017:1289–1290). A further study results again showed that personal initiative training yielded a statistically significant increase in sales and profits and the adoption of recommended business practices and innovation (Ubfal et al. 2019:18–19). Brooks, Donovan and Johnson (2018:197) found an average increase of 20% in weekly profits for mentees of an entrepreneur mentorship programme compared with 'muted results' for those receiving only business training programme. It may be concluded that ET has value, and that ET efficacy depends on developing entrepreneurial competencies, business management skills and personal entrepreneurial characteristics.

South Africa: Economic and entrepreneurship contexts

The study was conducted in South Africa, and the country's economy has not performed well in recent years. This is evident by the country's gross domestic product (GDP) growth (measured by production) of less than 2% per annum between 2015 and 2020, although it was higher in 2021 at 4.9% (World Bank, GDP growth [annual %] Data 2022). This low growth is compared with the preceding decade (2005–2015), in Figure 1. Furthermore, according to Herrington, Kew and Mwanga (2017:6–7), entrepreneurship in the country is dismal compared with sub-Saharan Africa and equivalent developing economies elsewhere.

Seminal research views the economic peak as the onset of economic recession, which may be understood in the business life cycle theory (Moore 1967:16; Mueller 1972:200–201). In this context, the trend line of Figure 1 is extremely worrisome because from 2006 to the time of this document's publication, South Africa's GDP growth trend has been downward. During the same time, South Africa experienced a persistent decrease in total early-stage entrepreneurship (TEA) from 2002 to 2016, and in 2016 was ranked 46th out of 65 economies for its TEA rate (Herrington et al. 2017:6–7). From the preceding context and rationale, effective ET is expected to lessen the dire situation of low business start-up rates and high numbers of existing enterprises closing in South Africa, which will contribute to increased economic output. The following subsection introduces the ET literature and problems currently experienced in the field.

Entrepreneurship training challenges: A brief insight

The characteristics of ET must be well demarcated to achieve the study's research objectives. Entrepreneurship training is intended *for entrepreneurial performance* outcomes and status in starting a business or achieving business
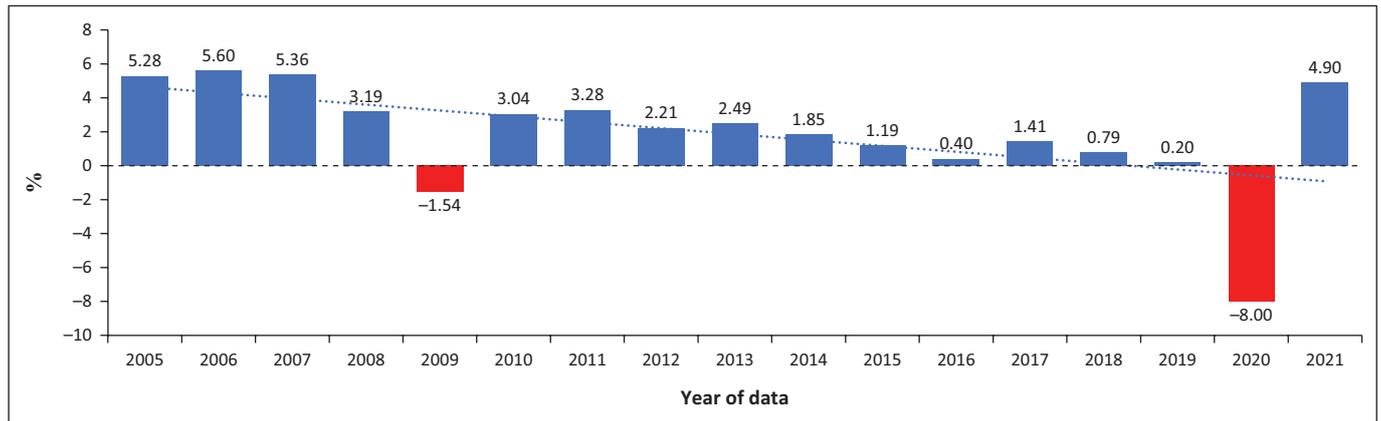
FIGURE 1: South African annualised gross domestic product growth rate 2005–2021.

growth, higher profits and wealth (Ács et al. 2018:1; Valerio et al. 2014:3). Therefore, ET for entrepreneurial performance has more to do with business growth, compared with day-to-day management (Botha et al. 2015:63–64; Morris et al. 2013:352). In comparison, EE programmes focus on building knowledge and skills *about entrepreneurship* according to Valerio et al. (2014:2), who build on Hynes' (1996) seminal study for demarcating ET from EE. Entrepreneurship training generally lasts between 5 and 15 full days, but not necessarily continuous days (McKenzie & Woodruff 2013:54). In comparison, EE is longer, perhaps a university or school term or even semester- and year-long programmes. Often, ET consists of workshops, discussion groups, role modelling, case studies and practical workshop materials compared with the EE lecture style model. In addition, professionals often facilitate ET, many of whom are entrepreneurs as opposed to academics who present EE.

Entrepreneurship training design

Kirkpatrick's seminal work argues that training design must match the trainees' requirements and a needs analysis must be conducted based on the individual, task requirements and organisation (Kirkpatrick & Kirkpatrick 2009:3–4). Furthermore, the transfer of training from the learning context to its application must take place, which is defined by its design and delivery to give trainees the ability to apply their learning to their jobs (Baldwin & Ford 1988:86–88; Grohmann, Beller & Kauffeld 2014:85–86). Real-world examples and practice-oriented tasks during training increase their practical significance and have been shown to positively influence their transfer (Baldwin & Ford 1988:86–87). Training design must consider potential barriers to transfer by including reflection exercises on possible solutions to such barriers (Grohmann et al. 2014:99).

Training design must also consider individual trainee characteristics, training context and facilitation style (Alvarez et al. 2004:389; Kirkpatrick & Kirkpatrick 2009:3–4). For example, in the context of teaching mathematics, teachers modify task difficulty to the level of their students'

understanding, interest and experience (Son & Kim 2015:7–8). In the ET context, training design must meet the needs of the participant entrepreneurs. For example, training content must develop the competence required in the entrepreneurial context of starting and growing enterprises (Botha et al. 2015:63–64; Morris et al. 2013:352).

Furthermore, content and process decisions (such as the order of the curricula content) influence instruction quality and, therefore, influence learner outcomes. Entrepreneurship training must consider the pedagogy approach, which may affect learner outcomes (Täks et al. 2014:574). For example, engineering students studying entrepreneurship were overwhelmed by collaborative learning (team tasks). Confusion also resulted from the entrepreneurial task of being solution-driven (seeking answers of their own) instead of replicating materials that the teacher provided (Täks et al. 2014:574). Active versus passive learning techniques distinguish *learning by doing*, rather than just gaining knowledge by reading; this is an important element of entrepreneurial learning (Wang & Chugh 2014:3–4).

From the aforementioned, according to Alvarez et al. (2004:389), training efficacy is the study of organisational, individual and training programme variables that collectively influence training outcomes before, during and after training ensues. These variables may influence training outcomes negatively or positively; furthermore, 'training effectiveness is a theoretical approach for understanding [training] outcomes' (Alvarez et al. 2004:387). Tonhäuser and Büker (2016:129) similarly identified training effectiveness as a question of which determinants, as a process, are responsible for successful training, and the authors refer to 'organisational, learning field and individual level' determinants. General vocational training efficacy literature provided this study with well-established concepts, constructs and existing measurement scales of the variable (determinant), namely training design.

In addition, self-efficacy theory is suited for this study, as the theory argues that individuals are responsible for their own training outcomes (Bandura 1977). This may be applied to

the ET setting, meaning that facilitators and participants of ET determine training outcomes. Bandura's (1977) seminal work established that an individual's belief in their ability influences events and outcomes in their life and career. Self-efficacy is defined as the belief in or expectation of one's ability to successfully execute whatever behaviours are required to develop the specific outcomes one desires (Bandura 1977:193).

In more recent vocational training contexts, participant self-efficacy argues that trainees are responsible for their learning. Participant self-efficacy is relevant in the ET context because entrepreneurs with a higher need for achievement and who believe they can implement what they have learnt from ET will most likely perform better than those who do not (Holton, Bates & Ruona 2000:334–335; Salas et al. 2012:79). Entrepreneurial self-efficacy in the context of ET (Chen et al. 1998:296; Gielnik et al. 2017:336) provided the theoretical underpinning for the variable (determinant), ESE, at the individual level. Entrepreneurial self-efficacy is important because it reportedly influences ET outcomes, according to Gielnik et al. (2017:336) and Chen et al. (1998:296).

Human Capital Theory (HCT) is another important theoretical foundation for this study. The theory stems from seminal literature, which predicts an individual's economic output will increase because of investment in their training (Becker 1962; Martin et al. 2013:212–213; Mincer 1958). More recently, HCT has been studied in the entrepreneurship context. Studies have found that high entrepreneurial task-related human capital contributes to entrepreneurial success through firm's growth (Marvel, Davis & Sproul 2016:599; Unger et al. 2011:344), and the concept of EHC has been developed. Therefore, HCT is important in the context of this study to structure an understanding of the relationships between ET and EHC formation. From the discussion expounded earlier, the concepts, constructs, theories and existing measurement scales from earlier research have been used in this study. Entrepreneurship human capital, which the study postulates as the expected outcome of ET, is briefly introduced next.

Entrepreneurship human capital measures

In the context of this study, EHC comprises entrepreneurial competencies, entrepreneurial non-cognitive skills and business management skills. Entrepreneurial competencies are measured through the knowledge, skills and behavioural and attitudinal ability required for starting and growing a business (Kyndt & Baert 2015:4–7; Le Deist & Winterton 2005:39–40; Mungule & Van Vuuren 2016:5). Business management skills are measured through the management functions of leadership, planning, organising and controlling. In contrast, management skills typically relate to areas such as finances, sales and marketing involved in day-to-day management operations (Botha et al. 2015:63–64; Morris et al. 2013:352).

In addition to EHC in the form of cognitive skills, the concept of entrepreneurial non-cognitive skills refers specifically to ESE in the study. This is based on seminal research by Chen et al. (1998:296), who found that entrepreneurs have higher levels of self-efficacy in areas of innovation and risk-taking compared with non-entrepreneurs, such as managers. Newman et al. (2019:404–405) define ESE as the belief that one can successfully perform entrepreneurial tasks with outcomes such as business start-up and growth. Furthermore, ESE links with the theory of planned behaviour based on Ajzen's (1991) work, namely that an individual's belief in their ability increases their planning to start and grow a business (Krueger & Brazeal 1994:94). Therefore, ESE is positioned as an IVV in the study and is expected to mediate or moderate the impact of ET on EHC.

Aboobaker's (2020:79) recent study finds a positive impact of ET on human capital development among university students but laments that few studies identify how ESE mediate such an impact (Aboobaker 2020:77). However, positive transfer climate is described as favourable policies and practices that ensure the transfer of training takes place (Baldwin & Ford 1988:86–88; Grohmann et al. 2014:85–86; Srimannarayana 2016:271) has been found to mediate the transfer of training (Schindler & Burkholder 2016:293). The literature on the mediating and moderating effect of ESE remains scarce and this creates the research gap that this study focuses on.

Theoretical contribution expected from the study

Self-efficacy theory posits that the belief in one's ability will influence achieving the outcomes one desires (Bandura 1977:193). Thus, ET efficacy relies not only on design and delivery but also on who is receiving the training. Therefore, participant self-efficacy is relevant in the ET context because entrepreneurs with a higher level of ESE will be more positive so that they can, and will, learn from ET. On this basis, they are likely to outperform participants with poor ESE and then achieve higher levels of EHC after training (Holton et al. 2000:334–335; Salas et al. 2012:79). However, the opposite may be true when individuals with higher levels of self-efficacy underestimate the entrepreneurial task requirement and subsequently underperform because they lacked in preparation (Gielnik, Bledow & Stark 2020:496).

A majority (six) of the study's hypotheses (see Section Methodology) are based on the expectation expounded earlier regarding ESE. Should the empirical study show support for the hypotheses, then the findings will contribute to the theory of self-efficacy in the context of ET. However, this is not unique as other studies have done so before (Miao, Qian & Ma 2017:89; Newman et al. 2019:404; Salas et al. 2012:84).

However, another aim of this research is to test ESE as the moderator and/or mediator of the effect that ESE has on the relationship between ET and EHC. This is a unique contribution of this study to the theory and practice of ET.

Methodology

This was a formal study with specific qualities and explicit research objectives, research questions and research hypotheses (Cooper & Schindler 2014:126).

Research hypotheses and key constructs

The study's research hypotheses, listed as follows, were based on the research objectives stated earlier and were supported by the literature consulted and the study's theoretical foundations:

H_1: Training design positively impacts entrepreneurial competencies.

H_2: Training design positively impacts business management skills.

H_3: Training design positively impacts ESE.

H_4: ESE positively impacts entrepreneurial competencies.

H_5: ESE positively impacts business management skills.

H_6: ESE moderates the impact of training design on entrepreneurial competencies.

H_7: ESE moderates the impact of training design on business management skills.

H_8: ESE mediates the impact of training design on entrepreneurial competencies.

H_9: ESE mediates the impact of training design on business management skills.

The key constructs are operationalised as follows:

- Entrepreneurship training is short term in duration (2–15 days), although the training days are not necessarily continuous. The ET develops entrepreneurial competencies and business management skills associated with business start-ups and growth. The ET training content, methods and pedagogy are focused on practical task activities that emphasise learning by doing and implementing (Botha et al. 2015; Mckenzie & Woodruff 2013; Valerio et al. 2014).
- Training design involves customising ET content, content layout and training methods to match the needs of the trainees (Kalinoski et al. 2013; Kirkpatrick & Kirkpatrick 2009).
- Entrepreneurial self-efficacy is the entrepreneurs' self-belief that they can successfully perform tasks with entrepreneurial outcomes, such as business start-up and growth and efforts to learn, persevere and improve business performance following ET (Bandura 1977, 2007; Newman et al. 2019).
- Entrepreneurial competencies are knowledge and behaviours for innovation, proactivity, risk-taking, creativity, recognising threats and opportunities, persistence, determination, generating new ideas, achieving newness, networking, acquiring resources, growing the business and starting further businesses (Kyndt & Baert 2015; Rezaei Zadeh et al. 2017).
- Business management skills comprise the key functions of leadership, planning, organising and controlling, and

daily skills are finance, sales, marketing, human resource management and operational management (Botha et al. 2015; Morris et al. 2013).

Research design and study sample

This study's sample was an ET project in the Eastern Cape Province of South Africa. This project provided ET for potential entrepreneurs to develop their entrepreneurial competencies and business management skills. The sample was located through a collaboration with the ET project's organisers, who allowed onsite data collection. In addition, consent forms were signed by all the trainees from whom data were collected. The researcher aimed for a study sample size of 440 potential entrepreneurs. However, it must be noticed that at the time of writing, the ongoing coronavirus disease 2019 (COVID-19) pandemic impacted the final study sample size. A total of 234 respondents were surveyed, using the intercept survey approach at the study site, which produced a net sample of 184 usable pre- and post-test surveys. This resulted in a related sample comprising 184 pre and 184 post participants, with a 78.63% usable survey response rate during the COVID-19 pandemic.

The study used empirical research by employing a quasi-experimental research design that differs from true experimental research when it does not have a control group (Cohen, Manion & Morrison 2007:282–283), as occurred with this research. The study followed the one-group pre-post-test experimental design. According to Cohen et al. (2007:282), this may be presented as $O_1 \rightarrow X \rightarrow O_2$, where O_1 is the pre-test baseline measurement (self-reporting survey), X is the treatment (ET) and O_2 is the post-test measurement (self-reporting survey). Experimental research is the most authoritative type of research design to show that casual relationships exist between variables (Cohen et al. 2007:265; Cooper & Schindler 2014:192–193). Experimental research has at least two cross-sectional measurements, meaning that time is required to elapse between the measurements (Blumberg, Cooper & Schindler 2011:197). This was a suitable design for the study to test the impact of ET on the experimental group before and after they participated in the ET programme.

Notably, a study's unit of analysis and the research respondents (whom data are obtained from) do not need to be the same (Blumberg et al. 2011:166). This applies to this study, as the research respondents are the ET participants in the experimental group, but the unit of analysis is the ET programme itself. This decision of the unit of analysis is based on the argument that the ET cannot be successful unless it meets the needs of those being trained (Kirkpatrick & Kirkpatrick 2009:3–4).

Data analysis

The causal research hypotheses of this study will be accepted or not based on probability, which is determined

by statistical significance (Christensen, Johnson & Turner 2014:180; Urdan 2011:62). Statistically significant relationships indicate that a real relationship exists between the IV and DV, and the relationship cannot be because of random factors. In this study, the IV was training design, and ESE was the IVV, while the DV was EHC, which comprised entrepreneurial competencies and business management skills. Before the inferential statistics, the sample descriptives are first presented.

Descriptive statistics

Table 1 refers that the study sample comprised more females (49%) than males (37%), although 14% opted not to answer this question. Most participants were youth with an average sample age of 27 years, with 72.3% of the sample aged between 18 and 35 years. Furthermore, the majority (66%) completed at least Grade 12, while 6% achieved a diploma or university degree, but 16% did not answer this question. The majority (74%) were unemployed. This ET project was therefore founded on youth entrepreneurship to alleviate unemployment and poverty.

Inferential statistics

Table 2 illustrates the inferential statistical procedures and purposes, as well as data and sample types used. It provides a brief explanations of the various inferential tests for the study.

TABLE 1: Descriptive statistics of sample characteristics (n = 184).

Demographic	Frequency (%)
Gender	
Male	37.0
Female	49.0
Non-response	14.0
Age (years)	
18–25	40.8
26–35	31.5
above 35	27.7
Education	
< Matric	12.0
Matric only	66.0
Above matric	6.0
Employment status	
Unemployed	74.0
Employed	7.0
Unknown	19.0

As illustrated in Table 2, in this study, the experimental group sample remained the same during the pre- and post-test and was, therefore, a related sample (Cohen et al. 2007:586–587). However, there were males and females and other demographic factors used to separate the sample into independent groups. The individual inferential test procedures that were considered for the study are now expounded upon.

Exploratory factor analysis

The study conducted exploratory factor analysis (EFA), and the results showed that the study's measurement scales were highly reliable with Cronbach's alpha scores for entrepreneurial competencies (0.903), ESE (0.820), business management skills (0.916) and training design (0.774). However, the data distribution was not considered normal because the skewness and kurtosis test results indicated a slightly abnormal distribution in the dataset. One reason for this abnormal data distribution was the study's smaller-than-expected sample size.

The paired sample t-test or Wilcoxon signed-rank test

While the paired sample t-test requires normally distributed data, the Wilcoxon signed-rank test is a non-parametric test and therefore does not. Urdan (2011:93) and Cohen et al. (2007:587–589) state that smaller sample sizes may create doubt about the normality of the distribution. Consequently, because of the study's small sample size, unequally distributed data posed a risk to the study in determining a statistically significant change in DV values ($O_2 - O_1$). Therefore, the Wilcoxon signed-rank test was conducted instead of the paired sample t-test (Cooper & Schindler 2014:400).

Regression analysis

Correlation and regression analysis quantify the strength of a relationship between quantitative variables. However, although the two analyses are similar, regression analysis enables the prediction of the DV based on known or assumed values for the IV (casual effect), commonly represented as the equation y = a + b (x). The elements of the regression analysis equation are y = DV, x = predictor variable (PV), a = y-intercept and b = slope. The slope is the percentage of y explained by a one-unit standard deviation change in x, and this equation computes the expected y-value based on the x-value. Linear regression analysis, thus overcomes the weakness of correlation

TABLE 2: Inferential statistics data analysis plan: Constructs and data type purpose.

Constructs	Data type	Inferential statistics	Purpose
Training design (IV)		T-tests or Wilcoxon signed-rank test	To determine a statistically significant variance in the scores of the pre- and post-test measures
ESE (IVV)		Simple regression analysis	To determine the impact of training design and ESE on entrepreneurial competencies and business management skills
Entrepreneurial competencies (DV)	4- and 5-point Likert scales Interval and/or ordinal data	Mann–Whitney U test or chi-square	To determine if subgroups differ in the distribution of scores and/or variance found in the DVs
Business management skills (DV)		Multiple linear regression analysis Multiple hierarchical regression analysis	To check covariates' influence on variance in EHC and validate the simple regression models To test ESE's moderator or mediator effects on the training design's impact on the EHC

Source: Authors' own compilation based on Cohen, L., Manion, L. & Morrison, K., 2007, *Research methods in education*, 6th edn., Routledge, New York, NY
IV, independent variable; IVV, intervening variable; DV, dependent variable; ESE, entrepreneurial self-efficacy; EHC, entrepreneurship human capital.

that merely studies the relationship without an equation for prediction (Cohen et al. 2007:537; Cooper & Schindler 2014:479). Regression analysis is valuable as it provides the statistical equation to predict the ET outcomes for future training programmes and was therefore employed for the study.

Entrepreneurial self-efficacy as a moderator or mediator

Interactive effects refer to testing for mediating or moderating relationships (Christensen et al. 2014:254). For example, the study sought to understand whether ET design was independent of ESE for ET effectivity (Urdan 2011:130). Moderating or mediating effects are evident when the existence or strength of a direct relationship between two variables depends on a third variable. When there are interactive effects, a third variable as a moderator or mediator will influence the magnitude or existence of path c, between training design and EHC, as illustrated in Figure 2.

As the moderator variable, ESE may increase or decrease the direct effect (path c) that training design has on EHC – the moderator effect is shown on the left in Figure 2. Importantly, the statistically significant relationship between training design and EHC exists independently of ESE, but ESE influences the magnitude of the relationship. The right-hand section of Figure 2 shows that the relationship between training design and EHC is indirect and exists through ESE as the mediator variable. Training design impacts ESE; ESE impacts EHC and thereby, training design impacts EHC indirectly through ESE (path c). Therefore, without ESE, there is no statistically significant direct relationship between training design and EHC – a mediator effect is in existence.

In the context of this study, moderating or mediating interactive effects were suggested to exist between training design: ESE and EHC. These relationships were tested using the Hayes PROCESS macro procedure models 1 and 4, which are regression analysis functions within the Statistical Package for the Social Sciences (SPSS). The options to conduct this regression analysis were through manual procedures (step by step; consequently) or the Hayes PROCESS macro procedure (Hayes & Preacher 2014). The Hayes PROCESS macro procedure is a specific design with an automated process instead of a manual one and, therefore, was selected as the procedure for testing Hypotheses 6–9.

Findings and discussion
The direct impact of training design on entrepreneurship human capital

The direct effects illustrated in Table 3 were represented by Hypotheses 1–5. It must be emphasised that simple linear regression first tested these relationships, individually and independent of any interaction, to illustrate how the three main constructs act directly on one another during training. The linear regression tests were necessary to be conducted first, to answer the first study objective, and thereby lay the basis to proceed to answer the second study objective.

Firstly, Table 3 indicates that the related-sample Wilcoxon signed-ranked test shows that entrepreneurial competencies' median increased by 0.679, a statistical ($p < 0.001$) and practically significant improvement ($d = 0.52$). Together with the regression result ($r = 0.471$; $R^2 = 0.221$; F-statistic = 51.184), it can be inferred that this ET programme was well designed and catered to the participants' needs. This ET's success largely resulted from training design, with the unstandardised coefficient $\beta = 0.574$ as a predictor of entrepreneurial competencies. Thus, it is concluded that every one-point increase in the standard deviation of training design increased entrepreneurial competencies by approximately 58%.

Secondly, Table 3 further indicates that the related-sample Wilcoxon signed-ranked test shows business management skills' median increased by 0.727, which was statistically ($p < 0.001$) and practically significant ($d = 0.53$). The regression ($r = 0.400$; $R^2 = 0.160$; F-statistic = 34.017) showed that the training design was successful in developing participants' business management skills (unstandardised coefficient $\beta = 0.563$). Therefore, it is concluded that every one-point increase in the standard deviation of training design increased business management skills by approximately 56%.

Thirdly, Table 3 shows that the related-sample Wilcoxon signed-ranked test shows ESE's median increased by 0.375, which again was statistically ($p < 0.001$) and practically significant ($d = 0.41$). However, the regression showed a weak
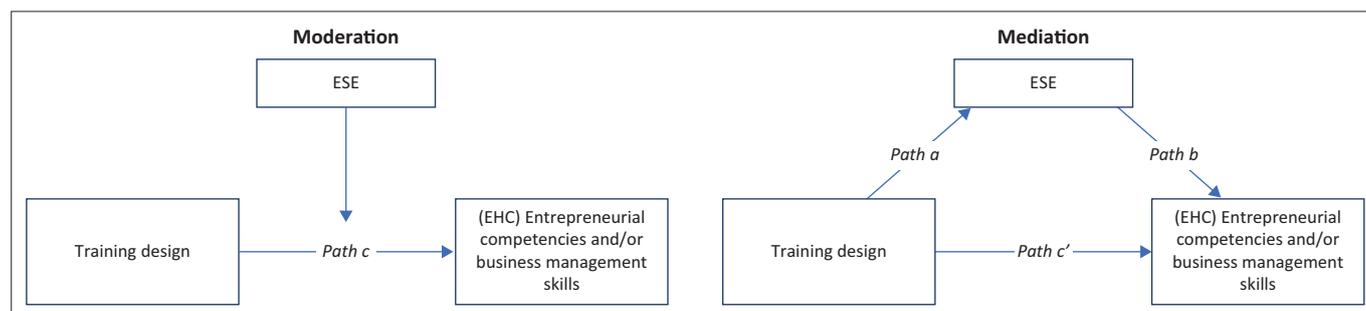
Source: Authors' own illustration based on Hayes, A.F. & Preacher, K.J., 2014, 'Statistical mediation analysis with a multicategorical independent variable', *British Journal of Mathematical and Statistical Psychology* 67(3), 451–470

ESE, entrepreneurial self-efficacy.

FIGURE 2: Research models of the effect of entrepreneurial self-efficacy on the impact of training design on entrepreneurship human capital.

TABLE 3: Inferential statistic results summary: Main effects of Hypotheses 1–5.

Effect description: Direct effect	Tests conducted	Hypotheses	Test results	Decision made and implication
Training design impact on entrepreneurial competencies	Related-sample Wilcoxon signed-ranked test	H_0 (default hypothesis): The median difference between the pre- and post-test measures for entrepreneurial competencies is equal to zero.	Median increase of 0.679, standardised z-value = 9.913, p-value = 0.000, statistically significant ($p < 0.001$) and Cohen's d = 0.52.	Training design had a moderately positive, statistically significant and medium-sized practically significant impact on entrepreneurial competencies.
	Simple linear regression	H_1: Training design positively impacts entrepreneurial competencies.	Moderately positive impact r = 0.471, R^2 = 0.221, F-statistic (51.184), p = 0.000, statistically significant ($p < 0.001$) and unstandardised B = 0.574.	H_0 was rejected. H_1 was accepted.
Training design impact on business management skills	Related-sample Wilcoxon signed-ranked test	H_0 (default hypothesis): The median difference between the pre- and post-test measures for business management skills is equal to zero.	Median increase of 0.727, standardised z-value = 10.077, p-value = 0.000, statistically significant ($p < 0.001$) and Cohen's d = 0.53.	Training design had a moderately positive, statistically significant and medium-sized practically significant impact on business management skills.
	Simple linear regression	H_2: Training design positively impacts business management skills.	Moderately positive impact r = 0.400, R^2 = 0.160, F-statistic (34.017), p = 0.000, statistically significant ($p < 0.001$) and unstandardised B = 0.563.	H_0 was rejected. H_2 was accepted.
Training design impact on ESE	Related-sample Wilcoxon signed-ranked test	H_0 (default hypothesis): The median difference between the pre- and post-test measures for ESE is equal to zero.	Median increased by 0.375, standardised z-value = 7.768, p-value = 0.000, statistically significant ($p < 0.001$) and Cohen's d = 0.41.	Training design had a weak positive, statistically significant and small-sized practically significant impact on ESE.
	Simple linear regression	H_3: Training design positively impacts ESE.	Weak positive impact r = 0.269, R^2 = 0.072, F-statistic (14.129), p = 0.000, statistically significant ($p < 0.001$) and unstandardised B = 0.313.	H_0 was rejected. H_3 was accepted.
ESE impact on entrepreneurial competencies	Simple linear regression	H_4: ESE positively impacts entrepreneurial competencies.	Strong positive impact, r = 0.613, R^2 = 0.372, F-statistic (103.875), p = 0.000, statistically significant ($p < 0.001$) and unstandardised B = 0.609.	ESE had a strong positive and statistically significant impact on entrepreneurial competencies. H_4 was accepted.
ESE impact on business management skills	Simple linear regression	H_5: ESE positively impacts business management skills.	Moderately positive impact r = 0.552, R^2 = 0.305, F-statistic (78.008), p = 0.000, statistically significant ($p < 0.001$) and unstandardised B = 0.675.	ESE had a moderately positive and statistically significant impact on business management skills. H_5 was accepted.

ESE, entrepreneurial self-efficacy.

positive impact (r = 0.269; R^2 = 0.072; F-statistic = 14.129), indicating that training design was less successful in developing ESE than developing entrepreneurial competencies and business management skills. With an unstandardised coefficient β = 0.313, it is concluded that every one-point increase in the standard deviation of training design resulted in ESE increasing by approximately 31% – only half of the prediction magnitude of training design on entrepreneurial competencies and business management skills. This result alludes to the independent personal nature of ESE, which is rooted in the theory of self-efficacy (Bandura 1977) and within the non-cognitive domain (Salas et al. 2012:84).

Fourthly, Table 3 highlights that the regression showed a strong and statistically significant positive impact (r = 0.613; R^2 = 0.375; $p < 0.001$; F-statistic = 103.875) of ESE on entrepreneurship competencies. With an unstandardised coefficient β = 0.609 and a medium-sized practical significance (d = 0.52), it was surprising to find that the impact of ESE on entrepreneurial competencies was much larger than that of training design on entrepreneurial competencies (r = 0.471; R^2 = 0.221). This is a unique insight as testing the two constructs within a single study for their independent impact on EHC is unprecedented. It is concluded that ESE was essential for improving EHC during ET in the context of this study – more so than training design as a one-point increase in the standard deviation of ESE increased entrepreneurial competencies by approximately 61%.

Lastly, Table 3 highlights that the regression showed a moderate and statistically significant positive impact (r = 0.552; R^2 = 0.305; $p < 0.001$; F-statistic = 78.008) of ESE on business management skills. With an unstandardised coefficient β = 0.675 and medium practical significance (d = 0.53), it must again be observed that the impact of ESE on business management skills was much larger than that of training design on business management skills (r = 0.400; R^2 = 0.160). This was a unique insight, as mentioned earlier. This finding again supports the aforementioned importance of ESE for improving EHC during ET. Therefore, it is concluded that with a one-point increase in the standard deviation of ESE, business management skills increased by approximately 68%. Based on Table 3, and the earlier discussion. Thus, *Hypotheses 1–5 were accepted.*

Discussion on the effect of training design on entrepreneurship human capital

It is emphasised that while ET was found to be a practical intervention to increase entrepreneurial competencies (H_1) and business management skills (H_2), it was notably less effective for increasing ESE (H_3). Overall, the training design's statistically and practically significant effects are consistent within the universal vocational training context and the ET field. Vocational training theory has long held the view that participants should be satisfied with the training design meeting their needs if the training increases their skillset and adds value to their organisations (Kirkpatrick & Kirkpatrick 2009:3–4). This finding is consistent in South Africa, where Botha, Nieman and Van Vuuren (2006:9) found that ET

contributes to statistically significant ($p < 0.001$; $N = 180$) increased entrepreneurial skills, knowledge and confidence, and business management skills. Additionally, Van Vuuren and Botha (2010:23) found a positive change in entrepreneurs developing basic entrepreneurship and business management skills following ET. Furthermore, this finding supports Botha et al. (2015:62), who found that entrepreneurial skills are essential for both start-up entrepreneurs and entrepreneurs with established businesses and should therefore be included in all ET curricula.

This research concurred that ET could improve entrepreneurial outcomes but found effect and intensity near twice that of Martin et al. (2013:23). The question that arose is: *What could be the cause of this substantial improvement?* Inadequate training design may be the cause (Kirkpatrick & Kirkpatrick 2009: 3–4), and according to Martin et al. (2013:23), their small practical effect size was because of poor course design, including poor teaching methods. Furthermore, the authors posit that the field of EET was still underdeveloped at the time of their study (Martin et al. 2013:23). It can, therefore, be concluded from this study that when training design is to the satisfaction and meets the needs of the participants, the practical effect sizes are much larger.

Consequently, as one of only a few studies that have empirically measured training design and investigated its impact on EHC, this study adds further impetus to Martin et al.'s (2013) suggestion that EET is still developing as a field. This study concluded an ongoing need to measure training design according to how satisfied participants are with ET content, including the delivery thereof. In this study, this refers to facilitators who deliver ET exceptionally well, or not.

Pretorius, Nieman and Van Vuuren (2005:13–14) found that South African facilitators' confidence, ability and qualifications (including actual entrepreneurial experience) determine successful ET outcomes. Therefore, in the study context of South Africa, a lack of well-qualified and experienced facilitators must be considered a contributing factor to ET inefficacy. Furthermore, training design must consider and reflect transfer design to ensure the transfer of training from the learning context to the application destination (Holton et al. 2000; Velada et al. 2007). For instance, including real-world examples and practice-oriented tasks during training increases the practical significance of the training. In the ET programme used for this study, the examples used during training (4.571/5) and programme activities and exercises (4.415/5) were rated superbly.

In conclusion, training design is vital to ensure the practically significant effect of ET on EHC. This is relevant given the inconsistency of small effect sizes commonly found when measuring ET successes within the ET literature (Premand et al. 2016; Rauch & Hulsink 2015; Valerio et al. 2014). This study measured training design

(87.90% satisfaction rating) and the finding agrees with Martin et al.'s (2013) contention that poor training design causes poor ET results and small practical effect sizes. In addition, successful ET delivery depends on the facilitator's expertise (Kalinoski et al. 2013:1098; Pretorius et al. 2005: 13–14), confidence and motivation to determine successful ET outcomes. Furthermore, the fact that ESE had larger predictor power on developing EHC than training design is without precedent. This finding is discussed in detail in the next section on the mediating role that ESE was found to have on the relationships between training design and EHC.

Entrepreneurial self-efficacy: Moderator and/or mediator of the impact of training design on entrepreneurship human capital

Tonhäuser and Büker (2016) emphasise that ET variables act independently and as a system to contribute to the success or failure of ET outcomes. This study pursued this line of enquiry and found independent relationships between ET and EHC variables. Following this, the study further investigated interactive moderating and/or mediating effects through Hypotheses 6–9. See Table 4, for more in-depth information.

Firstly, Table 4 illustrates that the moderation interaction expected in the first interaction effects was insignificant, with zero change seen in the R^2 value ($p = 0.700$). Therefore, it is concluded that ESE did not moderate the relationship between training design and entrepreneurial competencies. It must be noticed that the moderation model – when compared with the simple regression model – shows that the former statistically significant impact ($r = 0.574$; $p = 0.000$) of training design on entrepreneurship competencies became insignificant ($\beta = 0.28$; $p = 0.130$). At the same time, ESE became the statistically significant predictor ($\beta = 0.58$; $p = 0.000$). This hints at a mediation effect which is consistent with the rules of mediation effects (Hayes & Preacher 2014; Kenny 2021).

The first mediation test (H_8) results in Table 4 show that the 95% bias bootstrap confidence interval was entirely above zero: 0.398–0.772. This result confirmed that ESE was a mediator of the relationship between training design and entrepreneurial competencies. This also shows how, in the model, ESE reduced the previous effect training design had on entrepreneurial competencies (Table 4). Entrepreneurial self-efficacy (path b) became the statistically significant predictor ($\beta = 0.585$; $p < 0.001$) of entrepreneurial competencies. Based on Table 4 and the previous discussion, *H6 is unsupported and H8 was accepted.*

This finding partially explains why ET efficacy was found to be unreliable in prior studies (Martin et al. 2013; Premand et al. 2016; Rauch & Hulsink 2015), where some studies found positive results (Botha et al. 2015; Valerio et al. 2014; Van Vuuren & Botha 2010) and other studies did not (Nabi et al.

TABLE 4: Inferential statistic results summary: Interactive effects of Hypotheses 6–9.

Effect description: Interactive effect	Tests conducted	Hypotheses	Test results	Decision made and implication
ESE influences the relationship between training design and entrepreneurial competencies.	Hayes PROCESS macro procedure model 1 (multiple regression)	H_6: ESE moderates the impact of training design on entrepreneurial competencies.	This interaction (Int_1) is statistically insignificant ($p = 0.70$), as zero is found between the lower −0.67) and upper (0.45) confidence intervals, with no interaction (X*W) present with zero change (0.00) in the R^2 change value.	ESE did not moderate the impact that training design has on entrepreneurial competencies. H_6 was rejected.
	Hayes PROCESS macro procedure model 4 (multiple hierarchical regression)	H_8: ESE mediates the impact of training design on entrepreneurial competencies.	The interaction model is overall statistically significant ($p < 0.001$), path c statistically insignificant ($p = 0.16$) as zero is found between the lower (−0.11) and upper (0.63) confidence intervals, and path b ($\beta = 0.58$) is statistically significant ($p < 0.00$), without a zero between the confidence intervals value (0.39) (0.77).	ESE has mediated the impact that training design has on entrepreneurial competencies. H_8 was accepted.
ESE influences the relationship between training design and business management skills.	Hayes PROCESS macro procedure model 1 (multiple regression)	H_7: ESE moderates the impact of training design on business management skills.	This interaction (Int_1) is statistically insignificant (0.61), as zero is found between the lower (−0.89) and upper (0.52) confidence intervals. No interaction (X*W), and zero change (0.00) in the R^2 change value.	ESE did not moderate the impact that training design has on business management skills. H_7 was rejected.
	Hayes PROCESS macro procedure model 4 (multiple hierarchical regression)	H_9: ESE mediates the impact of training design on business management skills.	The interaction model is overall statistically significant ($p < 0.001$), path c is statistically insignificant ($p = 0.44$) with zero found between the lower (−0.29) and upper (0.67) confidence intervals, and path b ($\beta = 0.66$) is statistically significant ($p < 0.00$), without a zero between confidence intervals (0.43) (0.89).	ESE has mediated the impact that training design has on business management skills. H_9 was accepted.

ESE, entrepreneurial self-efficacy.

2017; Rauch & Hulsink 2015). Prior studies that have not measured participants' ESE levels cannot account for it as an explanation of ET ineffectiveness. The opposite is also true, and the uncertainty remains constant; in other words, even when studies find successful ET outcomes, the comprehensive understanding of why the ET was successful remains incomplete.

This study provided empirical support for ESE as a root cause of ET efficacy such that higher ESE influences ET outcomes positively. Furthermore, the study proved that ESE was an individual-level quality that interacted (mediated) with an organisation-level quality (training design). Therefore, differing levels of ESE at the start of ET influence participants' learning and progress. In the programme studied, participants registered a high average baseline score (above 75%) for ESE in the pre-test measure, showing that high ESE pre-programme influenced the ET efficacy, by interacting with the training design. This finding is unique overall and illustrates that the study and practice of ET must consider it a system, whereby individual- and organisational-level qualities act together in influencing ET efficacy.

Secondly, Table 4 illustrates that the interaction in the second moderation (H_7) test was also insignificant, with zero value evident between the lower confidence interval −0.89 and upper confidence interval 0.52. Furthermore, no interaction and zero change were seen in the R^2 change ($p = 0.61$); therefore, H_7 was unsupported. Similarly, this moderation model found that the former statistically significant impact ($r = 0.563$; $p = 0.000$) of training design on business management skills was largely reduced and became insignificant ($\beta = 0.19$; $p = 0.44$). Thus, ESE became the statistically significant predictor ($\beta = 0.66$; $p = 0.00$); again, this finding is consistent with the rules of mediation (Hayes & Preacher 2014; Kenny 2021).

Finally, H_9 was confirmed by the last row of Table 4 showing the 95% bias bootstrap confidence interval

entirely above zero: 0.43–0.89. Therefore, ESE was again a mediator of the relationship between training design and business management skills. With ESE, path b became the statistically significant predictor ($\beta = 0.66$; $p < 0.001$) of entrepreneurial competencies. This finding is unique because former studies have not undertaken such testing of interactive effects between ET variables. Based on Table 4 and the given discussion, *H7 is unsupported and H9 was accepted.*

Discussion on the mediation by entrepreneurial self-efficacy of the impact of training design on entrepreneurship human capital

The findings of H_8 and H_9 support the inference that ESE is very important not only for developing entrepreneurial competencies but also plays a vital role in developing supportive competencies such as the business management skills associated with starting and growing a business. This finding supports the argument and importance of why ET must include content on business management (Botha et al. 2015; McKenzie & Woodruff 2013; Morris et al. 2013; Valerio et al. 2014; Van Vuuren & Botha 2010). The mediation effect is slightly larger for entrepreneurial competencies than business management skills, which is not surprising as ESE is largely related to entrepreneurial activity (Chen et al. 1998) or entrepreneurial occupation (Newman et al. 2019).

This result is consistent with the idea that ET design should target ESE development. Gielnik et al. (2017:336) found that ET improves ESE, which improves passion that sustains ESE, resulting in higher business start-up rates in the longer term. It should be emphasised that the mediation results were consistent with simple regression results, showing that ESE had a larger impact on EHC than training design. This again provides a plausible explanation of the inconsistency of ET results and the small effect sizes observed in earlier studies (Martin et al. 2013; Premand et al. 2016; Rauch & Hulsink 2015). By inference, and to emphasise, unless the ET selection criterion specifically measures and targets participant ESE

levels on entry to the ET, then ESE will continue to inexplicably influence ET results.

Therefore, a vital implication of this study's findings is in support of earlier research, in that when individuals do not start a business it does not automatically indicate their lack of skills. Instead, it may indicate their lack of interest or belief that they can do so successfully (Chen et al. 1998). Chen et al. (1998) showed that individuals with high ESE have higher levels of self-efficacy in innovation and risk-taking. The study results support this idea and empirically showed that entrepreneurial skills and competencies do not replace the will, desire and vocational ambition to become entrepreneurs. Instead, quite the opposite occurs, with entrepreneurial skills and competencies supporting willing and ambitious potential entrepreneurs to open and grow businesses; this is consistent with findings by Gielnik et al. (2017:336) and Newman et al. (2019:404).

The overall results and discussion provide a robust contribution to the body of knowledge in the field of ET. Based on the discussion, the study achieved its objective of determining how and why ET is effective for EHC formation. The study's conclusions and recommendations for ET theory, practice, policy, management and research methodology on the topic, are now discussed.

Conclusions and recommendations
Contribution to entrepreneurship training research methodology

As cited, Nabi et al. (2017:278) report that too few ET studies employ true experimental research designs with pre- and post-test measures. The study has contributed a quasi-experiment with a pre- and post-test measure and employed multiple regression statistical methods to study the interactive effects of ET variables. The use of novel regression statistical procedures, in the context of ET research, furthered the understanding of how ET variables act as a system to increase ET efficacy. Thus, future studies are recommended to continue designing studies that employ multiple regression statistics and pursue such powerful statistical analysis. Additionally, the study has made a pioneering contribution.

Contribution to entrepreneurship training literature

This study has made an empirical contribution to how interactive effects of ET qualities at the organisational, learning and individual levels act as a system to bring about training success. This contribution enhances the understanding of ET efficacy. This has been argued as necessary to contribute to vocational training theory overall and specifically to why so many training programmes have poor results (Alvarez et al. 2004; Tonhäuser & Büker 2016; Valerio et al. 2014). This adds to the existing vocational training and more specifically ET literature. Future studies are recommended to consider such interactions and regard ET as a system.

Contribution to entrepreneurship training policy

This study has provided empirical support for ET as a tool to develop entrepreneurs and entrepreneurship to create jobs and grow an economy. The researcher recommends that policymakers continue to shape entrepreneurship policy frameworks that include ET. It is hoped that the insights developed in this study will assist policymakers in gaining more confidence in the value of ET, the direction for ET and the required resources and funding for ET success.

Contribution to entrepreneurship training management and practice

The study emphasised that a needs analysis is the foundation and 'gold' standard of ET design. Such a needs analysis may include interviewing participants before training, as performed by Van Vuuren and Botha (2010). Therefore, it is recommended that future ET design ensures a fit between ET content and delivery, participant entrepreneurs and their industry context, which will ensure that ET is not overly generic but caters to participants' specific needs. The design of ET requires expertise and focuses across several qualities. The custodians of this design process must include qualified practitioners who have the required academic qualifications, experience starting and growing a business, and facilitator efficacy in ability, confidence and motivation of the facilitator's performance.

Contribution to the theory of self-efficacy and literature on entrepreneurial self-efficacy

Finally, the study contributes clear empirical support that personal attributes, specifically ESE, have a huge impact on ET efficacy. This extends the implication of Bandura's (1977) seminal work on self-efficacy theory into the realm of ET and EHC outcomes. This contribution builds on the work of Salas et al. (2012:84), Miao et al. (2017:89) and Newman et al. (2019:404) and cannot be claimed as a unique contribution. However, a pioneering contribution is made through the finding that ESE mediates the impact of ET on EHC outcomes. This bluntly indicates that no matter how well designed and delivered ET is, without high levels of participant ESE, ET is likely to be ineffective. Further research is called for in support of developing this intriguing direction for the study of ET, ESE and EHC outcomes in the context of self-efficacy theory.

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Competing interests

Authors' contributions

Ethical considerations

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Data availability

The data supporting the findings of this study are securely filed with the authors in accordance with the relevant ethical protocols that guided the study.

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