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Exploring learning capability on entrepreneurial resilience of emerging contractor firms

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Orientation: The resilience of small businesses such as emerging contractor firms (ECFs) has been negatively affected due to problems from the environment like the coronavirus disease 2019 (COVID-19) pandemic. It is imperative for firms to navigate through this economic downturn by deploying learning capabilities to surmount these problems and boost resilience.

Research purpose: This study examines the influence of learning capability on the entrepreneurial resilience.

Motivation for the study: To establish the role of learning capability on entrepreneurial resilience of ECFs.

Research design, approach and method: Using a quantitative research approach and a cross-sectional survey design, a structured close-ended questionnaire was administered to 400 owners and managers of ECFs. The results of the study were analysed using Statistical Package for the Social Sciences (SPSS) version 23 and Smart PLS software 3. Descriptive percentage analysis, confirmatory factor analysis (CFA), multiple regression analysis, and structural equation modelling (SEM) were performed on the data set.

Main findings: The results suggest that all forms of learning have significant positive effect on entrepreneurial resilience (Transformative learning $B = 0.2207$, $p < 0.001$; exploitative learning $\beta = 0.2580$; $p < 0.001$; explorative learning $\beta = 0.5316$; $p < 0.001$).

Practical/managerial implications: The implications emphasise the different choices that small resource constrained firms must take in identifying and investing in those learning capability dimensions which best predict long term resilience.

Contribution/value-add: The study demonstrates the significance of firms' investment in learning, especially explorative learning to increase knowledge.

Keywords: emerging contractor firms; entrepreneurial resilience; learning capability; COVID-19; construction Industry.

Introduction

The construction industry's contribution to infrastructural development is critical given the protracted infrastructural deficit evident in most developing nations especially those on the African continent (Al-Atwi, Amankwah-Amoah & Khan 2022; Mafini 2019). The South African construction industry is among the most important industries in the country, contributes 9.6% to gross domestic product (GDP) and employs 1.4 million people (Construction Industry Development Board [CIDB] 2024). Empirical evidence suggests that emerging contractor firms (ECFs) constitute approximately 78.5% of businesses in the construction industry in South Africa (Statistics South Africa 2024). These statistics demonstrate the vital role ECFs play in fostering economic growth and development, even though their capacity to navigate difficult economic times has not been sufficiently tested in entrepreneurial literature.

Despite the acknowledged contribution of ECFs to the economy, the debilitating effects of coronavirus disease 2019 (COVID-19) on the productivity of construction small, medium and micro enterprises (SMMEs) whose activities are predominantly site-based and outdoor-related, clearly demonstrate that business-as-usual approaches are no longer feasible. Reductions in productivity, loss of revenue and collapse of many firms have been a distinct feature of business during the COVID-19-induced lockdown period (Min & Kim 2022). A report compiled by the CIDB (2023) demonstrates that the COVID-19 pandemic contributed significantly to the failure of approximately 51% of ECFs and precipitated extensive job losses in South Africa. This clearly indicates that firms in the construction industry failed to cope

with the new business models precipitated by the disruption of the bricks-and-clicks model of business operation during the pandemic. To further compound the situation, literature has established that most ECFs continue to operate in highly complex environments characterised by stiff competition (for customers and tenders) from large established firms, highly regulated environment, constantly changing technology demands and underpaying customers with low buying power (Akaba, Rambe & Agbobi 2022; Lesebo, Rambe & Ndofirepi 2022) all of which has negatively affected their resilience. As such, ECFs are increasingly called upon to embrace entrepreneurial resilience to survive especially when exposed to economic meltdown conditions.

Small, medium and micro enterprises, especially ECFs, operate in dynamic business environments that are characterised by persistent technological innovations, intense competition from large corporations and scarce resources that affect their businesses either positively or negatively (Steininger et al. 2022; Zhang, Zhao & Lyles 2018). These challenges, therefore, necessitate firms to deploy their capabilities such as learning capability and information technology (IT) capability to enhance their survival in a highly competitive industry and to boost their resilience. Resilience denotes the capacity of an entrepreneur to respond, adapt and transform business practices and processes in response to sudden adverse events that stem from the external environment (Carayannis et al. 2017; Grözinger et al. 2021). The need to improve the learning capability of firms, especially during crises and catastrophes, has been deemed critical by several studies (Al-Atwi, Amankwah-Amoah & Khan 2021; Bates et al. 2018; Chen, Fun & Yuen 2019). These studies have identified learning capability and IT capability as key antecedents of entrepreneurial resilience. Rafique, Hameed and Agha (2018) and Klonek, Volery and Parker (2021) suggest that learning capability, which involves the ability of firms to learn from the trends and complexities of the external environment, gives firms better knowledge that assists managers to take critical decisions that empower firms to overcome and bounce back from the numerous challenges that confront them and thereby improving entrepreneurial resilience. One can discern that because ECFs operate in a turbulent environment, investment in learning can be instrumental in these firms navigating and surviving complex, uncertain and challenging environments, thereby ensuring their resilience in these environments.

However, the rate at which businesses in the construction industry fail clearly demonstrates that most of these firms do not possess entrepreneurial resilience to weather the adverse effects of the environment in which they conduct their operations. Therefore, it is fundamental for ECFs to build resilience for their survival and long-term sustainability as entrepreneurial resilience provides hardiness, resourcefulness and optimism to entrepreneurs in conditions of extreme difficulty (Lakovic 2021; Monllor & Murphy 2017). Even though most studies (Bullough, Renko & Myatt 2014; Corner, Singh & Pavlovich 2017; Linnenluecke 2017; Shamsoddin et al. 2022) have sought to establish the antecedent factors that enhance entrepreneurial resilience, several gaps remain in current entrepreneurship literature. For instance, there remains a lack of clarity on whether the resilience of small firms is attributed to the internal psycho-affective quality of entrepreneurs (i.e. is internally generated) or is a consequence of pressures from external forces (Linnenluecke 2017; Schiavon, May & De Mendonça 2022).

Moreover, while both internal personality traits and external environmental factors have been identified as shaping entrepreneurial resilience, most studies (Korber & McNaughton 2018; Radfard et al. 2022) have concentrated on the relationship between resilience and firm performance.This lack of clarity on whether there are some antecedents of resilience or the broader environment shapes and provides an impetus for further research on the antecedents of entrepreneurship resilience (Coles, Ritchie & Wang 2021; Pathak & Joshi 2021; Salamzadeh & Dana 2022). For instance, it is unclear whether learning ability influences entrepreneurship resilience including which specific dimensions of this concept directly impact resilience (Dheer & Salamzadeh 2022; Hillmann & Guenther 2021). The variations on the factors that shape entrepreneurial resilience suggest the need to further investigate this concept to establish which antecedent factors including the extent to which these factors enhance entrepreneurial resilience. The study, therefore, addresses the following research questions:

1. What is the effect of explorative learning on entrepreneurial resilience?
2. What is the effect of exploitative learning on entrepreneurial resilience?
3. What is the effect of transformative learning on entrepreneurial resilience?

The current study contributes to the body of literature on resilience in two important ways. Firstly, the study presents internal capabilities especially learning capability as a fundamental internal force that could unleash organisational capacity to innovate, allowing small firms especially ECFs to proactively respond to, crises and difficulties to improve their entrepreneurial resilience and long-term sustainability (Ali et al. 2021).

Secondly, given the debilitating effects of post COVID-19 pandemic on on-site work-dependent professions such as construction schedules, on productivity, profitability and long-term survival of small entrepreneurial firms, the study contributes to the literature on post-pandemic survival strategies by spotlighting how organisational capabilities can contribute to organisational survival (Pathak & Joshi 2021). Therefore, identifying which dimensions of learning capability contribute to entrepreneurial resilience, would help in identifying components of learning capability that small resource-constrained businesses could devote their vital but scarce resources to.

The rest of the article is organised as follows: Firstly, the theoretical development section is presented. Secondly, a

detailed review of the literature on concepts and their dimensions is provided. Thirdly, the research methods including the sampling method, processes of selecting respondents, data collection and data analysis are presented. The findings are subsequently discussed and their implications for theory, policy and practice are discussed. Fourthly, the limitations of the study are presented and finally, a conclusion is given.

Theoretical development

Dynamic capabilities theory

Dynamic capability describes the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments (Kurtmollaiev 2020; Teece, Pisano & Shuen 1997). There is a clear distinction between operational capabilities that capture the current operations of an organisation and dynamic capabilities, which emphasise the capacity of an organisation to purposefully create, extend or modify its resource base (Helfat et al. 2007). As such, learning capability constitutes a dynamic capability to the extent that it allows a small firm to creatively combine, reconfigure, stretch and repackage its resource base in ways that allow the firm to survive turbulent times and weather the adverse impacts imposed on it by the broader business environment.

Within strategic management literature, there are two main ways of characterising dynamic capabilities: abilities and routine-based operations (Kurtmollaiev 2020). The 'ability-based approach' conceptualises dynamic capabilities as abilities in a circular manner. It considers these abilities, which encompass capabilities, capacities, and competencies, as compositional variables. Additionally, this approach tends to incorporate the explanandum within the explanans. Contrastingly, the routine-based approach places emphasis on certain organisational routines such as dynamic capabilities, creating a superfluous hierarchy of organisational capabilities and accepting a blurry line between dynamic capabilities and ordinary capabilities (Kurtmollaiev 2020). We adopt the abilities-based approach as a way of foregrounding the competencies, capabilities and strategies that small firms in volatile, uncertain, complex and ambiguous contexts harness to enact, navigate and advance to promote their long-term survival and overcome such environments.

Despite the intellectually appealing nature of the dynamic capabilities theory, it is not without critique. For instance, there is consensus in strategic management literature and entrepreneurship that the theory is still in its infancy and much of the scholarly work around the concepts remains mostly conceptual and focussed on foundational-level issues such as those of definitions of the term (Di Stefano et al. 2009; Di Stefano, Peteraf & Verona 2014). Furthermore, the concepts and terms associated with the use of this theory remain vague and under-theorised but elastic, thereby offering the advantage of facilitating a more flexible development path (Helfat & Peteraf 2009; Winter 1995).

Literature review

Entrepreneurial resilience

The complexity associated with the definition of the term entrepreneurial resilience creates problems for its conceptualisation and the appropriate selection of measurement (Li et al. 2022; Mulyani 2020; Robinson et al. 2018). To start with, the term resilience has different operational meanings depending on its context of use. In physics, it implies a material's ability to revert to its original shape following deformation (Sheffi 2006; Zhao et al. 2022), while in ecology, the term denotes the capacity of a system to accommodate change, while continuing to maintain its development trajectory subject to disturbances and changing conditions (Adekola & Clelland 2019; Hopkins 2021). In psychology, resilience implies the ability of individuals to cope with, adapt to and bounce back from adversity (Alberti et al. 2018).

Given the high causality rate of small firms in both developed and developing countries, resilience has become a common discourse in entrepreneurship literature (Lee & Trimi 2021). For entrepreneurship firms, resilience symbolises continuously anticipating and reacting to deep, secular trends that can permanently damage the earning prowess of a core business (Amankwah-Amoah, Debrah & Nuertey 2018; Marcucci et al. 2021). Therefore, at the core of demonstrating resilience is the firm's ability to institute specific arrangements to respond to natural hazards or other emergencies in terms of 'safeguards', 'preparedness' and 'the unexpected', as well as support post-event recovery (Imran et al. 2018; Spieske & Birkel 2021). Thus, this concept demonstrates the proactive posture of entrepreneurs manifested in anticipation of challenges, developing measures to mitigate the adverse effects of such challenges including handling post-recovery scenarios that may be unanticipated. At the core of resilience is the ability of the entrepreneurs to anticipate threats from the business environment to mitigate the extent of actual damage when disasters occur as well as salvage the firm after its disruption by environmental threats (Branicki, Sullivan-Taylor & Livschitz 2018; Portuguez Castro et al. 2020). Assuming that firms have the resilience to weather external threats presupposes that they possess and can harness their internal capabilities to prepare and adequately respond to unexpected events. Yet, most small entrepreneurial firms often lack the necessary capacities, capabilities and resources needed to predict unexpected events ahead of time (Asamoah et al. 2020). This deficiency, according to empirical literature, tends to compromise the ability of such ventures to withstand shocks.

There is a lack of consensus in the literature on whether entrepreneurial resilience should be conceptualised as a process or an outcome. When viewed as a process, resilience underscores how entrepreneurial firms deploy internal adaptive capabilities to deal with adverse situations to achieve resilient outcomes (Duchek 2020; Raetze & Scheuch 2019). When conceived as a process, resilience takes a pre-emptive

and pro-active posture in which firms harness their adaptive capacities to effectively deal with impending threats before they occur rather than after these debilitating events have occurred. As such, compared to reactive measures, a proactive strategy is deemed critical to entrepreneurial firms' achievement of positive outcomes (Portuguez Castro & Gómez Zermeño 2020). A process perspective is fundamental to the realisation of better organisational outcomes (e.g. increased productivity and performance) as it allows researchers to appreciate the boundary conditions under which resilience is built and sustained by resource-constrained small firms. The criticisms levelled against the process perspective is that while this approach presupposes a proactive posture in anticipation of adverse environmental setbacks, in practice, the resilience of firms can only be ascertained and tested after an adverse event has actually occurred (Islam et al. 2021; Ofunoye 2017). This characterisation suggests an irreconcilable chasm between conceptualisation and operationalisation (especially measurement) of this elusive concept. Put differently, if resilience as a process involves dealing with negative situations before they occur, it becomes problematic for resilience to be measured appropriately as such resilience lies in the nature of the response after a mishap or disaster has already occurred. This means any action taken by the firm before the calamity happens would be difficult to characterise or measure as resilience.

When resilience is conceptualised as an outcome, attention shifts from processes leading to the expression of such resilience as the ability of entrepreneurial firms to recover and bounce back from destabilising events which could only be evaluated after such events have occurred (Pedauga et al. 2021; Stephan & Drencheva 2017). Therefore, the capacity of the firm to weather the adverse effects including how they can continue to sustain themselves after such calamity becomes the benchmark for calibrating resilience. Because response to external adverse effects can be measured in more absolute terms compared to anticipating responses to such effects, the outcome perspective has gained currency as a more realistic expression of resilience. The main criticisms levelled against this approach are its overly descriptive character and lack an analytical depth (Stephens et al. 2021; Weinberger et al. 2018). For this study, entrepreneurial resilience is operationalised as the capacity of an entrepreneur to respond, adapt and transform business practices and processes in response to sudden adverse events that stem from the external environment (Carayannis et al. 2017; Grözinger et al. 2021).

Dimensions of entrepreneurial resilience

Despite the various dimensions of entrepreneurial resilience advanced in entrepreneurial literature (Butterick & Charlwood 2021; Ketchen & Craighead 2020), the more popular dimensions are resourcefulness, optimism and hardiness. Extant literature (Bashir et al. 2023; Zhang et al. 2023) suggests that a firm's learning is made up of three main components which are exploratory, transformative and exploitative learning.

Resourcefulness

Resourcefulness refers to the skills, capacity and resources that the entrepreneur possesses that enable him and/or her to navigate through challenges and hostile conditions in the course of running their business ventures (Efobi & Orkoh 2018; Meyer et al. 2020). Resourcefulness has been shown to be the most important dimension of entrepreneurial resilience given the abundance of challenges in the business environment that threaten the growth of firms. The need to deal with challenges of competition, untapped markets, demanding customers and complex regulatory environment necessitates entrepreneurial firms to harness their tangible and intangible resource capacities and human abilities in addressing these challenges. Therefore, resourcefulness manifested in embedded skills and capacities is deemed central to navigating through turbulence, avoiding setbacks and preventing business failure (Dedahanov 2016; Haneberg 2021; Wang et al. 2018).

There has been no compelling evidence to suggest that firms always need to be resourceful to demonstrate resilience as some firms may survive turbulent times by chance. For example, in developing countries characterised by institutional voids (Dekel-Dachs et al. 2021), small enterprising firms with meagre financial, technical and technological resources and limited institutional support have managed to weather adverse effects as a matter of a survival strategy rather than an abundance of resources. Despite this criticism, a study conducted by Ayala (2014) showed that resourcefulness was the most important dimension that enhances the entrepreneurial resilience of firms.

Hardiness

Hardiness has been defined as the ability of an entrepreneur to adapt and perform under stressful conditions while remaining emotionally healthy and stable (Foster et al. 2020; Mozammel et al. 2018). It also refers to goal-setting orientation, commitment and decision-making of entrepreneurs in the face of adverse situations (Höllen, Lengfeld & Konrad 2020). Hardiness involves entrepreneurs' display of perseverance when confronted with hardships and emotional stability in the face of difficult times. This is a unique requirement, in African contexts where firms may need to operate based on limited cash flows because of delayed payments from public institutions and customers defaulting payments when services are offered on credit.

Purwanto et al. (2020) state that entrepreneurs exhibit hardiness by turning threats or adverse situations into opportunities while at the same time having the determination to face challenges and overcome them. In general, hardiness requires entrepreneurial firms to welcome change, especially in the African contexts characterised by economic policy inconsistencies (e.g. changes in exchange rates, changes in municipal bylaws and a lack of clarity on operation hours). The need to adapt may propel firms to replenish their knowledge base as a means of dealing with turbulence that could negatively affect the resilience of firms (Shahbaz et al.

2020). However, the size of ECFs may constrain firm founders from seeking new knowledge through education and specialised training because of a lean organisational structure and over involvement of owners in routine operations of the business. However, another view suggests that hardiness may not only be derived from educational attainments and training but also from the capacity to learn from mundane activities. For instance, Carruthers (2020) contends that hardiness is the ability of firms to learn from past challenges when conducting their daily operations and turning these into opportunities. This form of learning ability allows entrepreneurs to have better practical knowledge about the environment, thereby buffering them against adverse conditions that would affect them or their firms.

Optimism

Optimism is the capacity of the entrepreneur to have a positive attitude despite difficult circumstances (Kolade et al. 2020). It also means an entrepreneur's ability to maintain a positive disposition in challenging situations, under circumstances where the outcome is either unpredictable or unknown (Prah & Sibiri 2020). Maintaining a positive posture towards business operations has been difficult in the South African construction industry where approximately 50% of small businesses have collapsed in the last 3 years (Statistics South Africa 2023) because of the negative impact of the COVID-19 pandemic on such operations. This harsh economic situation has affected the confidence of entrepreneurs because of the loss of sales and profit (Lee & Trimi 2021; Liu et al. 2020).

Despite these grey areas, the literature emphasises the importance of remaining optimistic even in the face of uncertainty (Conz & Magnani 2020). Optimism helps entrepreneurs see mistakes as opportunities to believe in and have confidence in the capacity of their skills and capabilities to turn threats into opportunities. For ECFs, therefore, the possession of optimism cannot be negotiated if entrepreneurial resilience is to be enhanced.

Learning capability

Learning capability is defined as a systematic and organised culture, commitment and practice of the firm that facilitates knowledge acquisition in support of the fundamental business strategy (Hailekiros & Renyong 2016). It also refers to the ability of an organisation to implement the proper management practices, structure, procedures and policies that foster learning (Slack & Brandon-Jones 2021). For Sollander and Engström (2021), learning capability means the set of organisational factors or values that influence the propensity of the company to create and use knowledge. Despite the diversity in semantic definitions, an overarching theme of learning capability is the acquisition of knowledge. This implies that the amount of knowledge at the disposal of a firm could determine the survival, growth and competitive edge of a firm. Loch and Sommer (2019) and Ruijter et al. (2021) submit that learning capability tends to become a common practice in firms where there is top management support for the whole learning process. In corroboration, Shields (2019) and Zhang et al. (2021) stress that top management creates an environment that allows individuals in the firm to learn from the business environment to broaden their knowledge base. It can be assumed that the acquired knowledge is applied by individuals in the execution of duties to create superior performance for the firm. Consistent with the view of the pivotal role senior management plays in the development of learning capabilities, Shields (2019) and Zhang et al. (2021) stress that top management creates an enabling environment that allows employees to learn from the business environment to broaden their knowledge bank. At the core of this argument is the knowledge that employees acquire, although the organisation can be positively deployed in the execution of duties to create superior performance for the firm.

To the extent that ECFs operate in an environment riddled with challenges such as the complexity of projects, a lack of managerial skills and intense competition, the possession of learning capability is fundamental to the survival of firms in this industry. Davies (2017) and Melnychuk et al. (2021) agree that learning capability is an important resource for firms because it enables firms to improve efficiency which eventually results in high productivity. For ECFs, one could assume that employees' acquisition of learning capability can be instrumental in improving project delivery times, reducing the cost burden of scope creep and enhancing the quality of projects when new knowledge is deployed to on-task project activities. In addition, Onosu (2020) pointed out that firms that succeed in developing continuous learning achieve superior competitive advantage through the delivery of innovative products and cost minimisation. Yet, this view is not without criticism. For instance, Strom-Andersen (2020) warns that the amount of knowledge possessed by a firm can only be beneficial to the firm when such knowledge is applied to the processes and procedures of the firm.

Explorative learning and entrepreneurial resilience

Exploratory learning is defined as 'market-based learning focussed on the search for the unknown and new opportunities through the acquisition of knowledge that is distinct from existing organisational expertise' (Bauwens 2020:35). This type of learning is associated with the constant search for new external knowledge to enhance the knowledge capacity of the firm and to take advantage of opportunities in the market (Madsen 2020; Nwaiwu 2018; Zhong & Chen 2022). The sourcing of new market information can counter threats from the complex business environment by creating new opportunities to deliver innovative products and services that boost the competitive advantage of firms. The significant leverage that new information renders to firms, manifests in the generation of personal initiatives and systems that enable the continual scanning of the external environment to broaden the knowledge capacity of the firm (Dentoni et al. 2020; Donbesuur et al. 2023). When employees employ new sources of information such as web browsing, social networks and other information repositories to develop new approaches to the delivery of projects, they are better positioned to

weather the adverse effects imposed by demanding customers and complex policy environments thereby ensuring the survival of their firms. Scholars and researchers agree that explorative learning makes it possible for firms to collaborate with external partners to acquire new knowledge. This enables the firm to sense and scan for new markets that have not been served as well as, improve profits and revenue (Ali et al. 2022; Ivanov 2020; Zucchella & Previtali 2019).

Although there is limited literature that explores the direct interaction between explorative learning and resilience, some studies have found connections between the former and the latter (Bashir et al. 2023; Zhang et al. 2023). For instance, some works affirm that explorative learning indeed positively affects the resilience of small businesses (Belhadi et al. 2022). This happens when firms use new knowledge to improve productivity and make better decisions that culminate in superior performance, which is an ingredient of entrepreneurial resilience. Paradoxically, the dearth of acquisition of new knowledge by ECFs because of problems of finance, research and development, and innovative capacity poses a major risk to the entrepreneurial resilience of small firms (Popa et al. 2022). Evidence (Oh & Kim 2022; Ruijter et al. 2021) suggests that the ability of firms to survive pressure from the marketplace and the level of resilience firms enjoy is a function of the proportion of new knowledge applied in business practices and processes. Based on the foregoing discussion, it can be hypothesised that:

H1: *Explorative learning exerts a positive and significant effect on entrepreneurial resilience.*

Exploitative learning and entrepreneurial resilience

Exploitative learning is 'based on routines that allow firms to refine, extend, and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into its operations' (Xu & Li 2020:12). This form of learning is concerned with how the firm uses existing knowledge to adapt to the external environment (Nicola et al. 2020). This suggests that firms use past and existing knowledge, experiences and competencies as means of understanding current trends in the market and developing better ways of meeting the demands of current customers and markets.

Exploitative learning focusses on devising ways of improving the internal knowledge base of employees through introspections of the firm's activities over a specific duration (Brouder 2020; Hillman 2022; Jiang & Ritchie 2017). It is inferred that exploitative learning involves limited external collaboration because firms gather their information through mistakes and scenarios encountered in the conduct of business operations. In general, exploitative learning capability enhances the learning processes of a firm through the adaptation of the product to the market and interactions among internal stakeholders (Elbaz, Agag & Alkathiri 2018; Hall et al. 2020; Ufua et al. 2022). Because ECFs constantly strive to improve their competitiveness and survival, they could apply exploitative learning during post-pandemic times (e.g. post-COVID-19) and economic decline, which lead to low demand for products and reduced profits that threaten the survival of the firm. Exploitative learning provides firms with the opportunity to maximise scarce resources by tapping from the firm's stock of knowledge to improve efficiency (Filimonau & De Coteau 2020).

The relationship between exploitative learning and entrepreneurial resilience is an inconclusive debate. While some literature (Lee & Trimi 2021; Mokline & Ben Abdallah 2022) suggests that exploitative learning improves the resilience of firms, other contends that the survival and resilience of small businesses cannot be achieved only through the application of existing knowledge embedded in the firm. However, exploitative learning enhances a firm's ability to identify and monitor market threats defensively, which leads to improved performance, increasing the resilience of the business by absorbing internal and external shocks (Gorjian Khanzad & Gooyabadi 2021; Settembre-Blundo et al. 2021). There is a growing consensus that integrating existing knowledge in business operations leads to a reduction in variation, maintenance of stability and pursuance of efficiency which play a significant role in promoting entrepreneurial resilience (Ragmoun 2022). Thus, it can be hypothesised that:

H2: *Exploitative learning exerts a positive and significant effect on entrepreneurial resilience.*

Transformative learning and entrepreneurial resilience

The concept of transformative learning in the field of education gained traction through the work of Jack Mezirow (2000). Transformative learning is defined as a process:

> [*B*]y which we transform our taken-for-granted frames of reference to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove truer or justified to guide action. (p. 7)

As such, there are some close associations between this concept emphasising change of mindset and John Dewey's seminal works on self-reflexivity in education, which he deemed critical to promoting social change in education. This view is also buttressed by other scholars who refer to the concept as a deep, structural shift in basic premises of thought, feelings and actions which changes someone's core assumptions (Hall & Prayag 2020). At the core of transformative thinking is an intense commitment to new modes of inquiry, a total change in opinions and actions of individuals that results in the development of new behavioural patterns.

In the entrepreneurship context, transformative learning means the ability of firms to retain, assimilate and reactivate knowledge to bring a complete change in the knowledge structure of the firm (Benge & Neef 2018; Subadra 2020). This definition suggests that the firm provides avenues at individual levels to foster the acquisition of new knowledge that changes individuals in the execution of their duties. For ECFs, this may take the form of combining different pieces of information from other departments and tapping into the

expertise of smart or newly appointed staff with newer perspectives on problem-solving. Dolnicar and Zare (2020) agree that transformative learning emphasises qualitative learning and could serve as a bridge between explorative and exploitative learning. For ECFs, transformative learning could be deployed to execute complex projects and innovative tasks as this may require a mental revolution and change of business processes that bring fundamental changes to the organisation's operations. In addition, transformative learning involves improvement in the firm's learning practices that result from the interaction among the various departments (Chen, Fung & Yuen 2021; Tian & Soo 2018).

Recent research has shown that transformative learning may substantially affect entrepreneurial resilience. Accordingly, various studies (Rialti, et al. 2020; Ryabchikov & Ryabchikova 2022) demonstrate that transformative learning can change the perceptions of employees towards how they execute duties. This propels employees to harness innovative ways of conducting daily business operations to improve products and services that will leverage the competitive advantage, which in turn enhances the resilience of firms (Uzoma Ebubechukwu & Edwinah 2022). Scholars suggest that transformative learning encourages the absorption and transformation of knowledge by increasing responsiveness to the external environment, thereby contributing to increased performance (Gorjian Khanzad & Gooyabadi 2021). The foregoing argument is a recipe for enhancement in the entrepreneurial resilience of ECFs. Jum'a, Ikram and Alkalha (2022) also corroborate that empirical evidence supports the view that transformative learning positively affects the resilience of small businesses. Consistent with the aforesaid narratives, it can be hypothesised that:

H3: *Transformative learning exerts a positive and significant effect on entrepreneurial resilience.*

Control variables

Many researchers have studied the impact of demographic factors such as gender, age and education on the resilience level of small businesses, particularly ECFs. The relationship between demographics and entrepreneurial resilience is an inconclusive debate. While some literature agrees that resilience exhibited by small businesses is influenced by factors such as gender, age and education level (Bashir et al. 2023; Zhang et al. 2023), other literature contends that demographic factors (gender, age and education level) do not have any significant impact on entrepreneurial resilience (Lee & Trimi 2021). In support of the growing consensus on the significance of demographics on resilience, Mokline and Ben Abdallah (2022) highlighted that male entrepreneurs tend to have high levels of resilience in comparison to their female counterparts. This explains why male entrepreneurs can manage their businesses for several years despite the challenges posed by the business environment (Ryabchikov & Ryabchikova 2022). Lower levels of resilience exhibited by female entrepreneurs could be attributed to problems that women face in Africa such as marginalisation and financial exclusion from public support and private financial institutions, and family responsibilities which prevent them from becoming successful entrepreneurs (Ragmoun 2022). Therefore, one can postulate that gender exerts a positive and significant effect on entrepreneurial resilience.

Scholars have also examined the effect of the level of education on the resilience of small businesses. The general perception in literature is that entrepreneurs with high levels of education tend to have more resilient businesses than their less educated counterparts. The logic is that these highly educated entrepreneurs normally know where to turn for help when confronted with crises while at the same time being able to build strong networks when compared to others with low or no education attainment (Coles et al. 2021). These factors enable such entrepreneurs to build resilient businesses which can withstand storms from the external environment. Even though studies (Pathak & Joshi 2021) demonstrate insignificant differences in education level on resilience, studies by Salamzadeh et al. (2022) proved that entrepreneurs with more education are resilient when faced with adverse situations and respond positively to threats. Therefore, the level of education tends to exert a positive and significant effect on entrepreneurial resilience.

Evidence from the literature also suggests that the age of the entrepreneur affects the resilience of their business. Hillmann and Guenther (2021) contend that older entrepreneurs are likely to run resilient businesses as compared to younger entrepreneurs. The argument is that older entrepreneurs tend to be more experienced, and have greater industry knowledge and the resources needed to run successful businesses to remain resilient in the face of economic downturn. Contrary to the forgoing argument, a study by Dheer and Salamzadeh (2022) showed that the age of managers of small businesses did not have any significant effect on resilience. In view of the foregoing discussion, it is postulated that age exerts a positive and significant effect on entrepreneurial resilience.

Model development

The study used explorative, exploitative and transformative learning to evaluate the effects of learning capability on the entrepreneurial resilience of ECFs in the Free State province of South Africa. This postulation was based on the hypotheses postulated in Figure 1 and as discussed in the literature review. The model addresses three questions covering explorative, exploitative and transformative learning as antecedents of entrepreneurial resilience while controlling for age, gender and education.

Methodological issues

Research design and target population

This study adopted a positivist and quantitative research approach to address the research objectives. Given the study's preoccupation with determining associative and

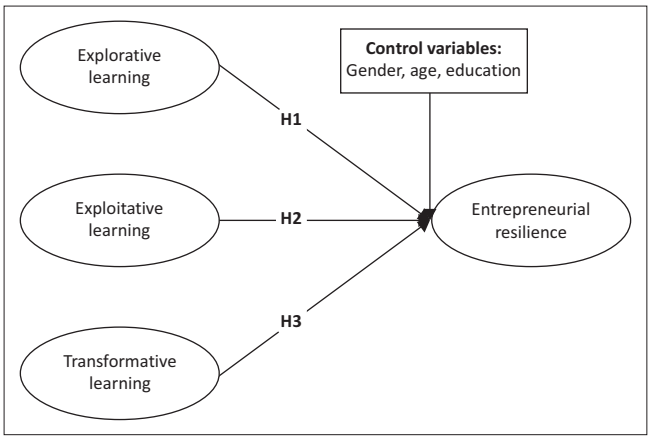


FIGURE 1: Conceptual model: Predictors of entrepreneurial resilience while modifying for age, gender, and education.

predictive relationships, the quantitative approach was deemed appropriate as is 'concerned with quantifying data and generalising results from a sample of the population of interest' (MacDonald & Headlam 2008:10). A descriptive cross-sectional survey design was employed to collect data from owners and managers of ECFs in the Free State province. A cross-sectional study is ideal for statistical investigations as it allows the researchers to collect data at a single point in time which is cheaper and less time-consuming (Nair & Prem 2020). Even though cross-sectional studies are often critiqued for their failure to capture the dynamics in data and variations in responses over time, we addressed this issue by collecting our data over two data collection points first in March 2023 and second in April 2023. Emerging contractor firms were targeted as respondents because of their significant contributions to the construction sector including their prevalence in the geographical location where the study was conducted.

Sampling and data collection procedure

Simple random sampling was used to select respondents from businesses that operated in the construction industry in the Free State province. The province was ideal for this study as it has one of the most economically active ECFs judging from their involvement in construction projects in the country. These names were extracted from the CIDB database of ECFs in the Free State region availed to the first author by the Free State Development Corporation (FDC). The CIDB database indicated that there were approximately 760 active ECFs in the Free State province. Structured questionnaires were considered appropriate to gather numerical data and secure the views of respondents on the variables identified in the conceptual model (Figure 1). Setting a Raosoft sample size calculator at 95% confidence interval (CI), 5% margin of error and response distribution of 50%, a target population of 760 generates a sample of 262. Simple random sampling was used to select the 262 respondents. This sampling involved conducting a raffle, in which ECF's names were put in a box that was shaken and names were randomly picked until the right number was reached. Given the poor response rate often associated with cross-sectional surveys, the sample was increased to 400 questionnaires to improve the chances of improved responses. Of the questionnaires that were administered, only 300 questionnaires were fully completed and received for statistical analysis. This represents a 75% response rate which is good enough for analysis, representativeness and generalisability.

Measurement instrument

The measurement instrument for the study was developed from existing scales. Specifically, Azadegan and Dooley's (2010) scale was employed to measure explorative learning. It covered frequent experimentation with important new ideas or ways of doing things, creative ideas that challenge conventional ideas and the actual percentage of sales that come from new products.

The exploitative learning scale comprised a strong emphasis on improving efficiency by the firm, refinement of existing technologies, and frequent adjustments of procedures, rules and policies to make things work better (Azadegan & Dooley 2010).

The transformative learning scale covered items such as deeply held beliefs that changed, developing a greater sense of responsibility towards others, changing goals for the future, major changes made in life, changes in view of ourselves, changes in our world views and how learning programme changed the lives of employees (Cox 2017).

Data analysis

Data were analysed using Statistical Package for the Social Sciences (SPSS) 23 and Analysis of Moment Structures (AMOS) 23 software. IBM Corporation, New York, NY. Descriptive percentage analysis, multiple regression analysis, confirmatory factor analysis (CFA) and structural equation modelling (SEM) were carried out on the dataset.

Reliability and convergent validity

The study examined the reliability of transformative learning, exploitative learning, explorative learning and entrepreneurial resilience. To assess the reliability of the latent variables, the internal consistency method was used. The technique calculates the Cronbach's alpha coefficient for each construct. A high Cronbach's alpha value for a construct or latent variable suggests higher inter-item correlations which, in turn, indicate a higher degree of cohesiveness among the measurement items. The criterion for satisfactory reliability is a Cronbach's alpha coefficient of at least 0.7, which indicates that the construct or variable has good internal consistency (Hair et al. 2019).

The convergent validity of the variables was also examined using the average variance extracted (AVE). The AVE technique determines the degree of variance that is captured by a construct compared to the variance caused by measurement error. An AVE value greater than 0.5 suggests

an adequate level of convergent validity. Table 1 summarises the results of the reliability and convergent validity test.

Table 1 presents the factor loadings, Cronbach's alpha (α) and AVE scores both before and after removing certain indicator or measurement items that had low factor loadings. Any items with factor loadings less than 0.5 on a particular construct or latent variable were deleted. These items were deleted because they indicated that they were less related to the variable they were supposed to measure. After removing these items, composite scores were then calculated for the remaining indicators to represent the constructs or variables.

Table 1 shows that the construct of 'Transformative Learning' had satisfactory factor loadings ranging from 0.6615 to 0.9237 and Cronbach's alpha of 0.9397. The AVE score was 0.7380. No items were deleted for this variable. These findings suggest that the indicator items measuring Transformative Learning were highly reliable and valid, with good internal consistency (Hair et al. 2019).

The construct of 'Exploitative Learning' also showed that satisfactory factor loadings were all greater than 0.5 and Cronbach's alpha of 0.8533. The AVE score was 0.7793. These results suggest that the indicator items for Exploitative Learning were also reliable and valid, with good internal consistency (Shmueli et al. 2019).

The construct of 'Explorative Learning' had factor loadings all greater than 0.5 and Cronbach's alpha of 0.8747. The AVE score was 0.8001. These findings indicate that the indicator items measuring Explorative Learning were highly reliable and valid, with good internal consistency (Benitez et al. 2020).

Table 2 presents the Fornell–Larcker criterion results of the constructs. The diagonal values represent the AVE for each construct, while the off-diagonal values represent the correlations between the constructs. The results show that all the diagonal values (AVE) are higher than their corresponding off-diagonal values (correlations) for each construct, which indicates good discriminant validity. This implies that each construct in the study is measuring a unique and distinct construct, which is not highly related to other constructs in the study (Benitez et al. 2020). These results also indicate that each construct in the study has good discriminant validity, and there is no significant overlap between constructs (Hair et al. 2019).

The results in Table 3 summarise the outcome of the heterotrait-monotrait ratio (HTMT) method, indicating that all constructs had a ratio of less than 0.9, which is considered evidence of discriminant validity. This means that the correlations between the constructs are not so high that they could be interpreted as indicating that they measure the

TABLE 1: Reliable and convergent validity of the constructs.

Variable	Indicator item	Factor loadings	Before deleting indicator items with low factor loadings		After deleting indicator items with low factor loadings	
			α	AVE	α	AVE
Transformative learning	Q7	0.9237	0.9397	0.7380	0.9397	0.7380
	Q8	0.9205	-	-	-	-
	Q9	0.8250	-	-	-	-
	Q10	0.8834	-	-	-	-
	Q11	0.9145	-	-	-	-
	Q12	0.8547	-	-	-	-
	Q13	0.6615	-	-	-	-
Exploitative learning	Q14	0.9596	0.8533	0.7793	0.8533	0.7793
	Q15	0.9391	-	-	-	-
	Q16	0.7315	-	-	-	-
Explorative learning	Q17	0.9245	0.8747	0.8001	0.8747	0.8002
	Q18	0.9295	-	-	-	-
	Q19	0.8257	-	-	-	-
	Q50	-0.2976	-	-	-	-
	Q51	0.8695	-	-	-	-
	Q52	0.9057	-	-	-	-
Entrepreneurial resilience	Q53	0.8241	0.8750	0.3280	0.8926	0.6201
	Q54	0.8390	-	-	-	-
	Q55	-0.2610	-	-	-	-
	Q56	0.7528	-	-	-	-
	Q57	0.8986	-	-	-	-
	Q58	0.8735	-	-	-	-
	Q59	-0.0472	-	-	-	-
	Q60	0.2025	-	-	-	-
	Q61	0.0955	-	-	-	-
	Q62	0.2827	-	-	-	-
	Q63	-0.0434	-	-	-	-
	Q64	0.3638	-	-	-	-
	Q65	0.6394	-	-	-	-

α, Cronbach's alpha; AVE, average variance extracted.

TABLE 2: Fornell–Larcker criterion results.

Construct	Entrepreneurial resilience	Transformative learning	Exploitative learning	Explorative learning
Entrepreneurial resilience	0.6201	-	-	-
Transformative learning	0.2108	0.7380	-	-
Exploitative learning	0.2721	0.2607	0.7793	-
Explorative learning	0.2663	0.0829	0.1716	0.8002

TABLE 3: Heterotrait-monotrait ratio results.

Construct	Entrepreneurial resilience	Transformative learning	Exploitative learning	Explorative learning
Entrepreneurial resilience	-	-	-	-
Transformative learning	0.4501	-	-	-
Exploitative learning	0.7448	0.5517	-	-
Explorative learning	0.5741	0.3025	0.4981	-

same underlying construct (Saari et al. 2021). Therefore, it is concluded that the measures used in this study had adequate discriminant validity, indicating that they are indeed measuring different constructs.

Table 4 presents the inter-construct correlations based on Spearman's test. It shows the correlation between constructs, including transformative learning, exploitative learning, explorative learning and entrepreneurial resilience. Transformative learning, exploitative learning and explorative learning had moderate to strong positive correlations with entrepreneurial resilience (*rs* ranging from 0.330 to 0.528, all $p < 0.001$). Specifically, explorative learning had the strongest correlation with entrepreneurial resilience ($r = 0.528$, $p < 0.001$). Transformative and exploitative learning also showed moderate positive correlations with entrepreneurial resilience ($rs = 0.517$ and 0.447, respectively, both $p < 0.001$), indicating that entrepreneurs who continuously learn and adapt to changes in their environment may have higher levels of resilience.

TABLE 4: Inter-construct correlations.

Construct	1	2	3
Transformative learning	-	-	-
Exploitative learning	0.541***	-	-
Explorative learning	0.322***	0.412***	-
Entrepreneurial resilience	0.517***	0.447***	0.528***

***, Only three decimal digits are important for analysis.

Ethical consideration

An application for full ethical approval was made to the Central University of Technology's Institutional Planning and Quality Enhancement and a letter of ethics consent was received on 03 March 2023. The ethical clearance number is FMSEC31020. The researchers adhered to strict research ethics by asking respondents to participate voluntarily in the survey. They were apprised in clear terms of the purpose of the study and their right to withdraw from participating at any stage of the research process without any sanctions. Respondents were also assured of the privacy and confidentiality of any information supplied during the study.

Results and discussion

A hierarchical linear regression (HLR) analysis was conducted to assess if learning capability (transformative, exploitative and explorative) significantly explained the variance in entrepreneurship resilience while controlling for the influence of demographic variables (gender, age, highest education qualification, business experience, type of business activity and business legal form). An HLR assesses the relationship among a set of nominal, ordinal or interval or ratio predictor variables on an interval or ratio criterion variable (Nair & Prem 2020). The process of HLR entails entering each block of predictor variables one step at a time. Each regression block will be compared to the previous block to determine if the added predictors better predict the dependent variable. In this study, the demographic variables were entered in the first block and the sub-variants or variables of learning capability in the second block.

In this study, several assumption checks were performed, including normality tests, heteroskedasticity tests and the Durbin–Watson test for autocorrelation and collinearity statistics. The normality tests showed that the data was normally distributed, as indicated by the Shapiro–Wilk statistic of 0.993 with a *p*-value of 0.254, indicating that the data were suitable for parametric analysis. Heteroskedasticity tests were also conducted, and the Goldfeld-Quandt and Harrison-McCabe statistics showed no evidence of heteroskedasticity, with *p*-values of 0.915 and 0.897, respectively.

The Durbin–Watson test for autocorrelation showed that there was a significant positive autocorrelation in the data, with a Durbin–Watson statistic of 1.22 and a *p*-value of < 0.001. This indicates that the assumption of no autocorrelation was not violated. This means that the residuals (i.e. the differences between the predicted values and the actual values) are not independent and are positively correlated with each other. Positive autocorrelation can be problematic because it can cause standard errors to be underestimated, which can lead to biased coefficient estimates and incorrect hypothesis tests. Finally, collinearity statistics were calculated to assess the multicollinearity among the predictor variables in the models. The variance inflation factor (VIF) values ranged from 1.11 to 1.45, while the tolerance values ranged from 0.692 to 0.902. These values suggest that there were no significant collinearity issues among the predictor variables, indicating that the assumption of no multicollinearity was met.

TABLE 5: Demographic profiles and business profiles.

Variables	*n*	%
Gender		
Male	141	47.0
Female	159	53.0
Age (in years)		
< 20	7	2.3
21–30	49	16.3
31–40	86	28.7
41–50	135	45.0
> 50	23	7.7
Highest level of education		
Primary	10	3.3
Matric	36	12.0
Certificate	61	20.4
Diploma	82	27.4
Degree	88	29.4
Postgraduate	22	7.4
Business activity		
Civil and construction	100	33.3
Mechanical	86	28.7
Electrical	46	15.3
Plumbing	68	22.7
The years of business operation		
< 2	29	9.7
2–5	109	36.5
6–10	118	39.5
11–20	40	13.4
> 20	3	1.0

Table 5 presents the descriptive statistics of the data. In terms of gender distribution, most respondents were female and comprised 53.0% ($n = 159$) of the total sample. In terms of age, the '41–50 years' age group was the most prevalent category, representing 45.0% ($n = 135$) of respondents. Regarding educational attainment, most respondents had completed 'tertiary education' and constituted 64.2% ($n = 192$) of the total sample. Regarding business activity, 'civil and construction' and 'mechanical engineering' had the highest prevalence, accounting for 33.3% ($n = 100$) and 28.7% ($n = 86$) of respondents, respectively. With reference to years of business operation, 'between 6–10 years' constituted the most common range, with 39.5% ($n = 118$) of businesses falling into this category, suggesting a significant presence of moderately experienced enterprises.

The *R*-squared value is used to assess the model fit of a regression model. *R*-squared (R^2) is a statistical measure that represents the proportion of variance in the dependent variable that can be explained by the independent variable(s) included in a regression model. It is also known as the coefficient of determination. The *R*-squared value ranges between 0 and 1. An *R*-squared value of 0 indicates that the independent variable(s) in the model do not explain any of the variance in the dependent variable, while an *R*-squared value of 1 indicates that the independent variable(s) perfectly explain all the variance in the dependent variable. In addition, the *F*-value is used to test the null hypothesis that all the regression coefficients are equal to zero, indicating that the model does not explain any variation in the dependent variable. A large and statistically significant *F*-value indicates that the regression model explains a significant amount of the variation in the dependent variable and provides evidence against the null hypothesis.

In Model 1 (the control variables), the results (Table 6) showed that the demographic variables significantly predicted entrepreneurial resilience [$R^2 = 0.206$, $F(20, 258) = 3.34$, $p < 0.001$]. Thus, the control variables accounted for 20.26% of the variance in entrepreneurial resilience. However, each of the sub-categories of age ranges namely 21–30 years, 31–40 years, 41–50 years and above 50 years, compared to being below 20 years, did not significantly predict entrepreneurial resilience at the 0.05 level of significance ($B = 0.8260$, $p = 0.092$, $B = 0.6162$, $p = 0.219$; $B = 0.8889$, $p = 0.069$ and $B = 0.3554$, $p = 0.497$, respectively). Note that B or β represents beta, the standardised regression estimates.

In addition, when compared to having primary education only, all the sub-categories of the highest qualifications attained had significant positive to negative predictive effects on entrepreneurial resilience. The specific details are as follows: matric ($B = –0.8163$, $p < 0.001$), certificate ($B = 0.7619$, $p = 0.001$), diploma ($B = –0.6248$, $p = 0.005$), undergraduate degree ($B = –0.6620$, $p = 0.003$) and postgraduate degree ($B = 0.6158$, $p = 0.015$). From the results, a post-school qualification, compared to a primary qualification, was associated with lower levels of entrepreneurial resilience ($B = –0.7375$, $p = 0.025$).

The legal form of the respondent's business also had a significant effect on resilience, with close corporations and private companies, compared to sole proprietorships, being associated with higher levels of resilience ($B = 1.2197$, $p < 0.001$; $B = 0.5224$, $p = 0.006$, respectively).

The results in Model 2 (Table 6) show that the predictors namely transformative learning, exploitative learning and explorative learning including the demographic variables, collectively accounted for 64% of the variance in entrepreneurial resilience [$R^2 = 0.64$, $F(20, 258)19.73$, $p < 0.001$], indicating that the model as a whole was a good fit for the data. The addition of learning capability factors in Model 2 led to a substantial increase in the *R*-square [$\Delta R^2 = 0.434$, $F(3.255)$, $p < 0.001$], indicating that these factors accounted for a large proportion of the variance in entrepreneurial resilience. Specifically, each of these learning capability factors was associated with higher levels of resilience ($B = 0.2207$, $p < 0.001$; $B = 0.2580$, $p < 0.001$; $B = 0.5316$, $p < 0.001$, respectively).

Discussion

The study sought to examine the effects of different dimensions of learning capabilities on the entrepreneurial resilience of ECFs in a developing country context after controlling for certain demographic factors. The results demonstrate that explorative learning correlates positively with entrepreneurial resilience and the full model results are statistically significant ($\beta = 0.5316$; $p < 0.001$) at a 5% level.

TABLE 6: Effect of learning capability on entrepreneurial resilience.

Predictor	Model 1		Model 2		Collinearity statistics	
	Standard estimates (Beta)	*P*	Standard estimates (Beta)	*P*	VIF	Tolerance
Intercept	-	< 0.001	-	< 0.001	-	-
Gender					1.15	0.870
Combined	-0.0153	0.904	-0.0486	0.575	-	-
Age in years					1.22	0.820
21-30	0.8260	0.092	-0.8744	0.012	-	-
31-40	0.6162	0.219	-1.0600	0.003	-	-
41-50	0.8889	0.069	-0.8249	0.019	-	-
> 50	0.3554	0.497	-1.2100	0.001	-	-
Highest primary qualification					1.11	0.902
Matric	-0.2867	0.413	-0.8163	< 0.001	-	-
Certificate	-0.4090	0.227	-0.7619	0.001	-	-
Diploma	-0.5482	0.092	-0.6248	0.005	-	-
Undergraduate degree	-0.7375	0.025	-0.6620	0.003	-	-
Postgraduate	-0.4342	0.242	-0.6158	0.015	-	-
Years in operation					1.19	0.839
2-5	-0.0532	0.851	-0.1826	0.362	-	-
6-10	-0.4446	0.110	-0.5498	0.005	-	-
11-20	-0.2977	0.317	-1.0900	< 0.001	-	-
> 20	-1.3400	0.030	-1.5300	< 0.001	-	-
Civil and/or construction business activities					1.18	0.844
Mechanical	-0.1800	0.263	-0.1994	0.068	-	-
Electrical	-0.4325	0.029	0.8410	0.015	-	-
Plumbing	-0.1988	0.282	0.0256	0.841	-	-
Legal form (sole proprietor)					1.19	0.843
Partnership	0.2287	0.119	0.1903	0.062	-	-
Close corporation	1.2200	< 0.001	0.6591	< 0.001	-	-
Private company	0.5224	0.006	0.5802	< 0.001	-	-
Learning capabilities						
Transformative learning	-	-	0.2207	< 0.001	1.27	0.786
Exploitative learning	-	-	0.2580	< 0.001	1.42	0.706
Explorative learning	-	-	0.5316	< 0.001	1.45	0.692

Note: *B* or β means beta.
R-square for Model 1, 0.206; *R*-square for Model 2, 0.640; Change in *R*-square for Model 2, 0.434; *F*-value Model 1, 3.34 (20, 258); *F*-value Model 2, 19.73 (20, 258).
VIF, variance inflation factor.

From the result, explorative learning is statistically significant and can predict entrepreneurial resilience and the result suggests that a unit improvement in explorative learning will improve entrepreneurial resilience by 53%. The result further revealed that among the three dimensions of learning capability (transformative learning, exploitative learning and explorative learning), explorative learning has the greatest impact in predicting the entrepreneurial resilience of ECFs.

Explorative learning's positive correlation with entrepreneurial resilience is supported by earlier research. For example, literature (Chen & Liu 2022; Qalati et al. 2021) emphasises that explorative learning enables firms to acquire new knowledge that allows them to seize opportunities in the market as well as allows firms to predict and adapt to environmental changes in ways that allow them to remain robust and resilient. The observation is also consistent with strategic management views that the constant search for new technology, and innovative ways of delivering products and services collectively leads to enhancements in customer satisfaction and secures the future viability of firms (Chatterjee et al. 2023; Sawaean & Ali 2020). These developments in the long run promote the resilience of firms. This finding also supports the general perception in the literature that learning capability positively influences the resilience of firms. Therefore, the hypothesis that explorative learning exerts a positive and significant effect on entrepreneurial resilience is supported in this study.

The results further demonstrate that exploitative learning correlates positively and significantly with entrepreneurial resilience at a 5% level. The model assessment result indicates that exploitative learning is statistically significant ($\beta = 0.2580$; $p < 0.001$) at 5% in predicting entrepreneurial resilience. This means a unit improvement in exploitative learning of ECFs will increase the entrepreneurial resilience of small businesses by 25%, ceteris paribus. This observation highlights the importance of leveraging existing knowledge and competencies to develop better ways of working to improve flexibility, adaptation and effectiveness that enable firms to remain resilient, which is consistent with earlier research on the positive connection between learning capability and resilience of firms (Al-Jabri & Al-Busaidi 2020; Ngammoh et al. 2021). It also emphasises the relevance of firms' ability

to efficiently deploy experience and skills to churn out improved products and services to maintain market share that in turn promotes entrepreneurial resilience (Belhadi et al. 2021; Klonek et al. 2021). Based on the foresaid arguments, the hypothesis that exploitative learning exerts a positive and significant effect on entrepreneurial resilience is accepted in this study.

The results also suggest that transformative learning has a significant positive effect on entrepreneurial resilience ($B = 0.2207$, $p < 0.001$). Thus, the link between transformative learning and entrepreneurial resilience of ECFs is statistically significant at a 95% confidence level. A unit improvement in transformative learning can lead to a 22% increase in the entrepreneurial resilience levels of small businesses, specifically ECFs, all things being equal. The result further implies that transformative learning is very important for the achievement of higher levels of resilience by firms (Glaister et al. 2018; Ratten 2020). The positive association of transformative learning of ECFs with entrepreneurial resilience is supported by other earlier studies (Harney & Alkhalaf 2021). This observation is also consistent with the literature that suggests that indeed learning capability is critical to the enhancement of entrepreneurial resilience. This is because continuous learning enables firms to learn from their environment and appropriately respond to uncertainties which in turn promote high levels of resilience (Wong et al. 2021). Accordingly, the hypothesis that transformative learning exerts a positive and significant effect on entrepreneurial resilience is accepted in this study.

Implications

Implications for theory

The study drew on dynamic capabilities theory to shed light on the critical importance of capabilities especially learning capabilities to the development of resilience among entrepreneurial firms. To the extent that the lack of information on internal developments, a lack of resources and changing roles with small firms constitute sources of uncertainty that can hinder growth and stability (Bayer & Landau 2022), this study harnesses dynamic capabilities theory as a useful lens for demonstrating how the development of learning capabilities can allow the firm to shift and adapt the firm's behaviour in pursuit of resilience within specific contexts and environments. While technology and market related uncertainty act as significant drivers of innovation and research and development (Brettel et al. 2012), disruptions such as new offerings by competitors, changes in market conditions, increased competition and regulation in existing and new markets (Bayer & Landau 2022) present opportunities for tapping into learning capabilities to effectively navigate and address these challenges.

The study showcased how even though learning capabilities are often presented as disparate capabilities, explorative and exploitation capabilities work in combination to trigger the boundary conditions for the thriving and resilience of firms. For example, it is logical to postulate that exploitation, especially 'refinement, choice, efficiency, selection, implementation and execution' (March, 1991) can productively interact with exploration especially 'search, variation, risk taking, experimentation, flexibility, discovery and innovation' (Lee, Park & Lew 2022) in shaping entrepreneurial resilience. That said, we build on and extend this theory by demonstrating that even though exploration and exploitation require different structures, processes and resources, their effects on outcomes such as resilience although presenting significant differences (He & Wong 2004; Lee et al. 2022) are relatively comparable in effect.

Implications for policy

Because explorative learning exerted the greatest impact on entrepreneurial resilience compared to other learning capabilities, public institutions such as business incubation and accelerators must emphasise explorative learning's attributes such as discovery, experimentation and innovation to deepen the effects of this concept on the resilience of firms. For instance, opportunities for improved innovation and experimentation that lie in practical strategies such as design thinking, case studies, simulations, lean business canvas and venture pitching opportunities must be fostered through incubators and accelerators to deepen the search for new opportunities, risk-taking and discovery of new strategies, which all characterise explorative learning.

Given that compared to sole proprietorships, close corporations and private companies were associated with higher levels of resilience, government institutions providing entrepreneurship, leadership and technical support such as the Small Enterprise Development Agency (SEDA) must direct founding entrepreneurs' efforts at creating these corporations and private companies. Moreover, support systems such as free or subsidised legal and technical support in their establishment can be provided to ease the process of setting up such entities. Other interventions can include the provision of technical support for new ventures on how to file for corporate tax.

Implications for practice

Because the lowest qualifications (e.g. matric certificate, diploma and first undergraduate degree) attained had significant but negative predictive effects on entrepreneurial resilience, concerted efforts must be devoted to sustaining and developing learning capabilities at these lower levels of university education. For instance, greater incentives to advance learning capabilities such as providing more authentic and practically driven learning opportunities that provide greater independence, self-efficacy, and foster innovative and creative thinking, could be instrumental in deepening student learning capabilities at the undergraduate level. Other supportive initiatives would include providing students with greater exposure to business creation opportunities such as opportunity identification, validation, resource exploitation and business development within universities. This would allow students to deepen their

learning opportunities in ways that would boost their resilience by the time they transition to postgraduate studies or develop their entrepreneurial firms as new career pathways.

Given that all dimensions of learning capabilities were significantly and positively related to entrepreneurial resilience, highly productive work environments must be created with ECFs, particularly those that encourage discussion of productivity concerns, offer team collaborative tools, optimise training opportunities and emphasise time management to prevent procrastination (Ultimate Medical Academy 2024). Managers can complement this by building a learning culture and creating a supportive work environment in firms to promote and stimulate individual learning opportunities. Through this, individual employee's knowledge is integrated and aggregated into the firm's knowledge base with a view to contributing to superior long-term resilience.

Implications for future research

Future studies should incorporate longitudinal research designs with specific additional categories of respondents to reach broader conclusions and address the problem from a causal approach. Future research should also include other concepts such as entrepreneurial orientation as another antecedent to examine its effect on entrepreneurial resilience. Future studies should be conducted to include firms from other industries such as retail and manufacturing to broaden the generalisation of results and findings.

Limitations

The study was conducted solely in the Free State province and hence the extrapolation of its findings to other South African provinces, which have a different entrepreneurial culture, business climate, different population and different cultural groupings, may be limited. Therefore, there is no guarantee that the findings from this province can be generalised to other provinces unless they share similar contextual, socio-cultural, business and entrepreneurial development traits as those reported in this study. In addition, the views elicited may not be sufficiently representative of owners and managers of construction SMMEs (ECFs) in the whole of South Africa. This is despite the broad commonalities and similarities of challenges that small businesses face in the South African context.

Conclusion

The study sought to investigate the effects of learning capability on the entrepreneurial resilience of ECFs in the Free State province. Specifically, the study examined the extent to which the various forms of learning such as explorative learning, exploitative learning and transformative learning affect the resilience of small businesses. Evidence suggests that although all learning types (i.e. explorative, exploitative and transformative learning) exerted a positive and significant effect on entrepreneurial resilience, explorative learning had the greatest impact on the resilience of ECFs. Given that all dimensions of learning capabilities were significantly and positively related to entrepreneurial resilience, highly productive work environments must be created with ECFs, particularly those that encourage discussion of productivity concerns, offer team collaborative tools, optimise training opportunities and emphasise time management to prevent procrastination (Ultimate Medical Academy 2024).

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

F.A.B. and P.R. conceived the article. F.A.B. developed the methodology, performed a formal analysis and wrote the original draft. P.R. provided project administration, supervision and resources and was involved in writing the literature review of the article.

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Data availability

Data are available at: www.cidb.org.za

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