Women Participation in Digital Entrepreneurship: A Case Study of Gauteng Province in South Africa

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Digital Business

April 2021

ABSTRACT

South Africa is a developing economy that carries the potential to increase economic activity through digital technologies. Digital entrepreneurship has the potential to influence job creation with its low barriers to and ease of entry into the marketplace. With this in mind, the aim of this research was to analyse the participation of women in digital entrepreneurship in Gauteng Province.

The study was guided by the ontological philosophy that seeks to answer the research questions. A qualitative purposive online self-administered survey with open ended questions method was used. The software NVivo was used for data analysis to determine the factors that affect entrepreneurial activity and digital ecosystem characteristics in Gauteng and the challenges that women face in participating in digital entrepreneurship.

The study findings indicate that women in Gauteng participate in digital entrepreneurship, with most of the women respondents running 100% women-owned companies or having 51% or greater ownership of the companies. The cost of data in South Africa is still a hindrance to participation in the digital economy.

according The South African entrepreneurial ecosystem is conducive to new entrants to the system in terms of the policies that are currently available and a digital marketplace. The challenges and barriers that are faced by the women entrepreneurs can be overcome by these entrepreneurs utilising available digital socio-technical enablers such as mentors and networks.

Keywords

Digital Entrepreneurship, Digital Ecosystems, Women Participation

DECLARATION

I, Elsie Malenkane Phelane, declare that the study “Women Participation in Digital Entrepreneurship: A Case Study of Gauteng Province in South Africa” is my own work. It has not been submitted for examination or any degree in any other university. It is submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Digital Business I further declare that I have properly acknowledged all sources of information used in this study.

Signed at ……

On the …….. day of …… 2021

ACKNOWLEDGEMENTS

I would like to say a special word of thanks to the following people, whom without their guidance, support and encouragement this study would not have been possible:

- My beloved son, Thato, and daughter, Kananelo. I lost many hours of quality time with you while working on my report but you never complained and always allowed me to work. You are my pride and joy and I thank you for your patience.

- My Supervisor, Dr Manessah Alagbaoso. You guided me through my research from the start to the end. Your guidance and incalculable advice will never be forgotten. You have taught me so much that the value goes beyond just the research report,

- My parents and family. I could not have asked for better parents. I thank you and my sisters and brothers for believing in me.

- My friends, colleagues and acquaintances. Many times, you provided me with inspiration and motivation and also helped me to collect the data.

- To the people who kept me accountable. You made sure I kept going even when I felt like quitting.

- To every single female entrepreneur who assisted me with the completion of my survey. I would not have been able to conduct this study without you. Best of luck with your ventures.

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ABBREVIATIONS AND ACRONYMS

COMPEDIA	Comparative Entrepreneurship Data for Internal Analysis
DE	Digital Entrepreneurship
DEE	Digital Entrepreneurship Ecosystem
EIP	Entrepreneurship Indicators Programme
EU	European Union
GDP	Gross Domestic Product
GEDI/GEINDEX	Global Entrepreneurship and Development Index
GEM	Global Entrepreneurship Monitor
ICT	Information Communication Technology
IoT	Internet of Things
IT	Information Technology
NECI	The National Entrepreneurship Index
PSED	Panel Study of Entrepreneurial Dynamics
SADC	Southern African Development Community
SEFA	Small Enterprise Finance Agency
SME	Small Medium Enterprise
SOE	State-Owned Enterprises
TEA	Total Early-stage Entrepreneurial Activity
USA	United States of America
UNCTAD	United Nations Conference on Trade and Development

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

This research aims to explore the participation of women in digital entrepreneurship in the Gauteng Province of South Africa.

1.2 Context of the study

South Africa is a country found at the southern part of the African continent. It comprises in addition the sub-Atlantic archipelago of the Prince Edward Islands. South Africa has the largest mixed economy in Africa in which there is a mixture of private freedom, coupled with a centralised economic system and government control(Crede, 2016; Kavuli, 2014; Marks, 2020)

South Africa is a representative of the Southern African Development Community (SADC). The country has nine provinces: Eastern Cape, Western Cape, Free State, Gauteng, Kwa-Zulu Natal, Limpopo, Mpumalanga, Northern Cape and North West.

The World Bank report for 2015 ranked South Africa at 73 out of 189 countries with developed administrative systems and stable monetary systems for simplicity of doing business (World Bank, 2014).

Gauteng houses major industrial participants in the economy, covering sectors that range from mining to innovation and commercial. Gauteng represents 35% the Gross Domestic Product (GDP) of South Africa(“Digital Economy for Africa Innitiative,” 2019)The total early-stage entrepreneurial activity (TEA) is the prevalence rate of individuals that are actively involved in start-ups, nascent entrepreneurs or the owner/manager of a business that is less than 42 months’ old (Levie, 2010).

The TEA rate in Gauteng is 16.3% for men compared to 9.6% for women, as shown in Figure 1 below. Increasing the TEA rate of women in South Africa is essential to improving the South African economy and promoting women entrepreneurship(Evokari, Tibazarwa, Lindy, & Van Holland, 2019).

	Male TEA rate	Female TEA rate	Ratio female to male TEA
Gauteng	16.3	9.6	0.59
Rest of South Africa	12.9	9.8	0.76
Western Cape	5.5	3.2	0.58

Figure 1: TEA rates by gender in South Africa 2017 (Herrington & Kew, 2018)

1.3 Research problem

Globally, women often engage less in entrepreneurship activity than men do; the TEA rate for women is 10.2%, which is approximately three-quarters of that seen for men (Kamberidou, 2020). The rate of women's participation in entrepreneurship in South Africa reflects the world and developing country trends in terms of entrepreneurial activity(Chinomona & Maziriri, 2015; Development, 2019; Herrington & Kew, 2018; Kamberidou, 2020).

Although women's engagement has been growing recently, women are more reluctant than men to start a business (Jafari-Sadeghi, 2020). This is often due to women not likely to have access to cash and encounter different professional and family balance issues from male entrepreneurs. By increasing women's participation in entrepreneurship around the world, their success can lead to job creation and economic inclusion (Madsen, 2015)

There is a recognition that the environmental or economic factors that aid women's ability to participate in entrepreneurship differ from those that motivate men, and thus there is a need to delve into factors that impact women's

entrepreneurial participation (Terjesen & Lloyed, 2015)). Women are more likely to be operating businesses with the owner as the sole employee. As they gain more entrepreneurial education and opportunity, their businesses will naturally grow and be able to employ more people, which creates jobs (Hakobyan, 2016).

Entrepreneurial ecosystem factors such as education and training, access to mentors and human capital can affect the entrepreneurial participation of women in the ecosystem (Arenius, 2020; Kavuli, 2014; Naji, 2019;).

South Africa is a developing economy that carries the potential to increase economic activity through digital technologies, which come with a presumption of new business opportunity. The digital economy allows countries to step up entrepreneurial activities by capitalising on it.

Digital entrepreneurship has the potential to influence job creation and reduce the digital divide (Sahut, Iandoli, & Teulon, 2019). Digital technology similarly gives rise to other business opportunities and digital start-ups (Elia, Margherita, & Passiante, 2020; Kamberidou, 2020). It is hypothesised that digital entrepreneurship presents low barriers to and ease of entry into the marketplace (Bican & Brem, 2020; McAdam, 2020; Nambisan, 2017). However, there has been no contextualisation of the effects of digital entrepreneurship in South Africa regarding the participation of women.

Against this background, this study addresses the research problem of women entrepreneurship in Gauteng, with the aim of this research being to analyse the participation of women in digital entrepreneurship in this province. A qualitative purposive online survey method was used to determine the factors that affect entrepreneurial activity and the digital ecosystem characteristics in Gauteng and the challenges that women face in participating in digital entrepreneurship.

1.4 Research objectives

The study has five objectives as outlined below.

The first objective is to explore the participation of women in digital entrepreneurship in Gauteng, South Africa.

Secondly, the research aims to analyse the challenges facing digital entrepreneurship in Gauteng at the macro level, looking at factors such as policy and regulation, cybersecurity, and the digital marketplace infrastructure and digital user citizenship.

Thirdly, the research aims to analyse how micro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng.

The fourth objective is to assess how micro-level digital entrepreneurship barriers and frictions affect the participation of women in entrepreneurship in Gauteng.

The fifth objective is to explore the digital socio-technical enablers of digital entrepreneurship that may support the participation of women in the digital entrepreneurship economy of Gauteng.

1.5 Significance of the study

Entrepreneurship activity depends on the context in which the activity is taking place. The researcher desires to understand and to explore the importance and the interconnectivity of the context and factors that make up a conducive ecosystem for entrepreneurial activity in Gauteng.

The entrepreneurial ecosystem requires a comprehensive approach to grasp its dynamics and to identify the factors that affect its accomplishment. This emphasis on a comprehensive approach, along with the illustration of the ambiguity of new ventures, is supported in literature (Satalkina & Steiner, 2020b). Ambiguity in digital start-ups is caused by the disruptive nature of digital

channels and the entrepreneur's need to remain agile and receptive to constant change, coupled with constant customer engagement (Liam, 2018).

The entrepreneurship ecosystem is a known phenomenon; however, theoretical frameworks are lacking in the addition or incorporation of digital technologies. The exclusion of digital technologies in the entrepreneurship ecosystem leaves the literature short in its capability and capacity to advise policy makers about which elements are crucial to support digital entrepreneurship(Howard, O'connor, & Kuratko, 2016).

The frameworks identified in the literature that are used to qualify entrepreneurial activity also fall short in demonstrating the impact of digital technologies (Cavallo et al., 2019; Howard et al., 2016) in the context under study. There is a need to understand system conditions and the impact of digital technologies on systems such as entrepreneurship networks, finance, talent and other factors pertinent to the flourishing entrepreneurial activities in the digital area (Sahut et al., 2019).

This study will contribute by providing an understanding of the circumstances and conditions that facilitate digital entrepreneurship and women's participation in it. The study adds to the knowledge that guides business and policy makers who aim to promote the participation of women in digital entrepreneurship and highlights factors pivotal to digital entrepreneurship activity, given its good impact on economic activity, especially for women.

It is suggested that digital entrepreneurship lessens the barriers to entry into business and in this way makes it simpler for individuals to participate in the economy (Acs, Szerb, & Autio, 2016; Kuratko, Morris, & Schindehutte, 2015). Literature has not demonstrated this view in the South African context particularly, to indicate its legitimacy.

The present participation of women in entrepreneurship is lower than that of men(Cardella, Hernández-Sánchez, & Sánchez-García, 2020; Carrington,

2004); hence, the effect of digital technologies on entrepreneurship activity among women is not known(Özsungur, 2019b).

The research will contribute to the understanding of the digital ecosystem at the macro level by providing an understanding of factors such as policy, the digital marketplace and digital infrastructure that will affect women participation in digital entrepreneurship.

The research will also contribute to the understanding of the digital ecosystem at the micro level to add to the understanding of the factors that act as challenges or barriers to entrepreneurial activity, such as the need for digital skills, technology knowhow and managerial skills, which are some of the factors critical to the survival of women's digital business(Al Mamun, Fazal, & Muniady, 2019; Crede, 2016; Papulova & Mokros, 2007)

1.6 Delimitations of the study

- The study focuses on women in Gauteng Province and does not include the other eight provinces. Due to limited time frame for data collection
- The study focus on the participation of women in digital entrepreneurship excluding other genders
- The use of online survey instrument as opposed to the in depth interviews for a quantitative research. The time frame and state of emergency, presences of Covid 19 pandemic which resulted in limited travelling and necessitates less contact method of enquiry
- The survey is a self-administered in English, The online data collection tool allows for data management and handling to be manageable, it eliminates the human error that could come with the need for interpretation

1.7 Definition of terms

The following key terms are used throughout this research report and are defined here for clarity.

Table 1: Definition of terms

Term	Definition
Entrepreneurship	Someone who controls and operates a business (Antonizzi & Smuts, 2020), easily, can convey entrepreneurship as self-employment.
Digital entrepreneurship	Antonizzi and Smuts (2020) define digital entrepreneurship as entrepreneurial opportunities discovered and sought using frontier technologies and social media platforms.
Digital entrepreneurship ecosystems	Digital entrepreneurship ecosystems (DEEs) are social, technical and economic systems of complementary digital technologies and related players, based on a unique background(Skog, Wimelius, & Sandberg, 2018).

1.8 Assumptions

The study assumes that:

- There are women in Gauteng who are participating in the digital economy.
- The women participants in digital entrepreneurship are documented and part of the innovation development programmes and innovation hubs in Gauteng.
- The participants have knowledge of digital entrepreneurship and are able to share experiences of their participation in digital entrepreneurship.
- The research instrument is compatible with various digital devices

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

Entrepreneurship can be defined as:

> *"a dynamic process of vision, change, and creation. It requires energy and passion towards the creation and implementation of new value-adding ideas and creative solutions. It includes the willingness to take calculated risks, the ability to plan an effective venture team; the creative skill to marshal needed resources; and, the vision to recognise opportunity where others see chaos"*. (Howard et al., 2016, p.14)

With entrepreneurship as the central focus of this study, the literature review presented in this chapter considers academic literature concerning entrepreneurship, and the related concepts of the entrepreneurial ecosystem, digital entrepreneurship and digital ecosystems along with the place of digital entrepreneurship within current theoretical frameworks.

The chapter begins by presenting definitions of the topics covered in the study that are associated with entrepreneurship. It provides an understanding of entrepreneurship and the entrepreneur's motivation (opportunity or necessity) and capabilities with regard to entrepreneurship and digital entrepreneurship. It examines digital entrepreneurship and identifies digital entrepreneurship types that women can participate in such as academic and business.

It then focuses on the digital ecosystem and particularly the main issues that affect this ecosystem in South Africa.

The chapter then reviews theoretical frameworks that are relevant to digital entrepreneurship, with the aim of identifying a framework that can inform the study and answer the research questions developed from reviewing the literature.

The final section of the chapter describes factors that are important in establishing conceptual framework that could form the basis of the study. In this section, Challenges and barriers at both levels that affect digital entrepreneurs, particularly women digital entrepreneurs, at different stages of value creation are described and the available digital socio-technological enablers that can counter these challenges and barriers presented.

The literature review chapter is set out as shown in Figure 2.

- Entrepreneurship

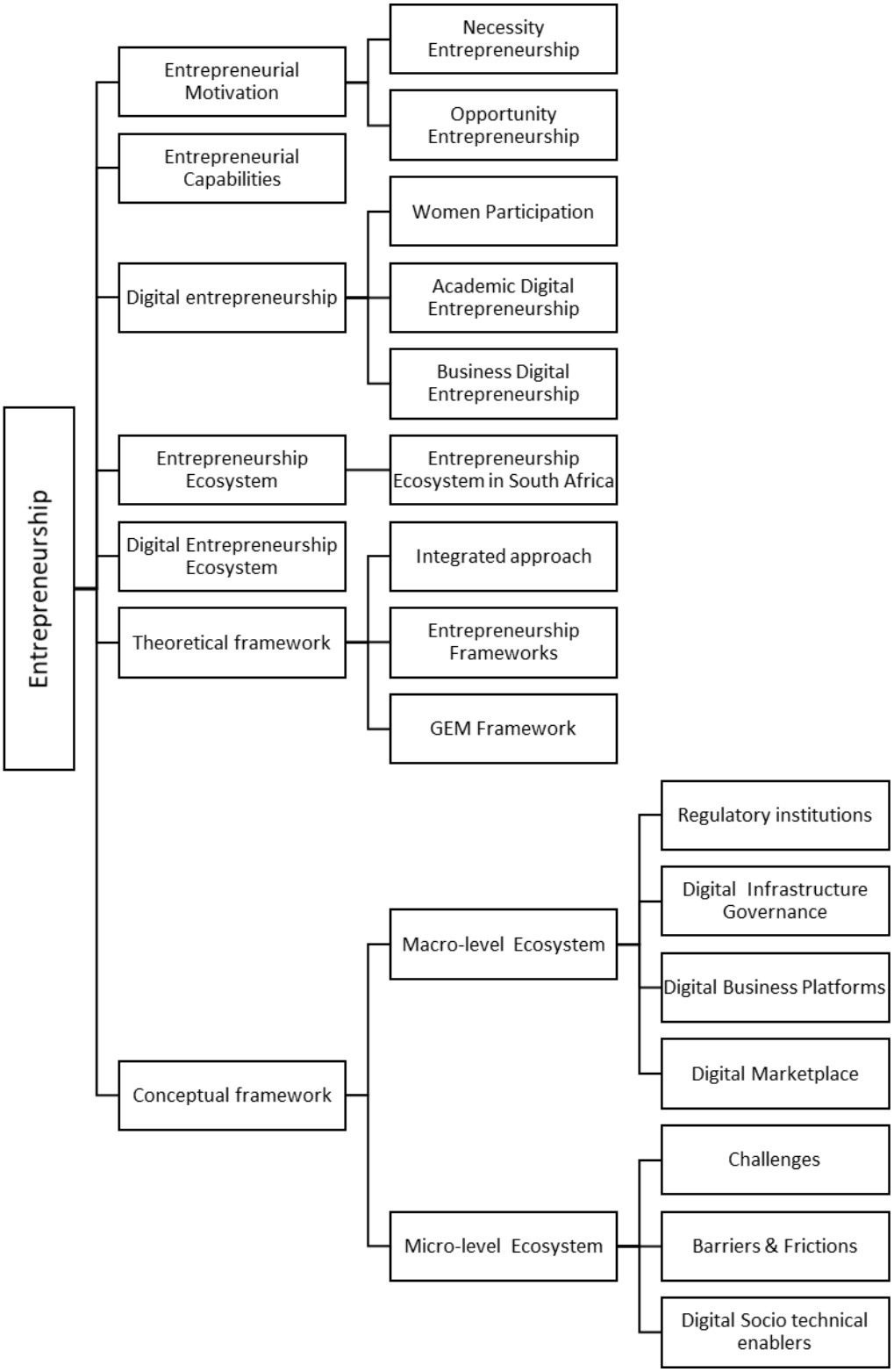

Figure 2: Mind map of the literature review

2.2 Entrepreneurship

Defined broadly by Howard et al. (2016, p.14) as “a dynamic process of vision, change, and creation”, entrepreneurship can be thought of as the means through which economic activities and organisations materialise(Davidsson, 2015). Entrepreneurship is an individual’s opportunity creation for financial benefit. There is a general view in the literature that entrepreneurship has the potential for job creation and economic growth and promotes inclusivity with opportunity creation for the unemployed (Block, Fisch, & van Praag, 2017).

Definitions of entrepreneurship range from a multi-layered discipline that combines activities for value creation, the creation of new ventures, and self-employment creation to poverty emancipation (Vineela, 2018).

The Global Entrepreneurship Index of 2019 defines an entrepreneur as a character with the insight to innovate and the expertise to create a value proposition to market (Ács, Szerb, & Lafuente, 2019). Risk-taking and value recognition are some characteristics of an entrepreneurial activity(Vineela, 2018).

2.3 Entrepreneurial motivation

Motivation can be described as a driving force behind undertaking an activity. Individuals and firms become entrepreneurial or entrepreneurs as a result of social, economic and cognitive factors (Özsungur, 2019a).

Motivation affects entrepreneurial behaviour in three ways. First, motivation affects the entrepreneurial behaviour by dictating the choice of an individual’s direction and business priorities. Second, motivation affects the intensity of the pursuit, based on the value or importance that the action has for the entrepreneur. Third, motivation influences the persistence of the effort, based on the path to achieving this purpose (Jafari-Sadeghi, 2020).

Women's motivation to become involved in entrepreneurship is typically governed by economic factors, and they usually choose entrepreneurship for self-advancement. However, women create their own businesses for diverse reasons, making motivation a significant part of running a business (Bhansing, Hitters, & Wijngaarden, 2018; Jafari-Sadeghi, 2020; Özsungur, 2019b; Stephan & Hart, 2015).

To understand and explore the participation of women in digital entrepreneurship in Gauteng, one has to assume that this new emerging phenomenon will present women with enough motivation in terms of choice, intensity of value and persistence of effort in achieving their purpose for them to become entrepreneurs.

2.3.1 Opportunity entrepreneurship

Jafari-Sadeghi (2020) defines opportunities as cases in which the organisation of goods, services, resources and markets occurs and leads to new business creation. Opportunities are concrete realities discovered by entrepreneurs and used to create new market niches. Perception attributes such as risk tolerance, self-esteem and self-confidence are important to the entrepreneur's persuasion of opportunity taking.

The motive behind opportunity entrepreneurial activity is the pursuit of a better livelihood rather than an enforced alternative to earn more money and create wealth (Howard et al., 2016; Kuratko et al., 2015).

Lack of confidence and business experience, fewer business-orientated networks, and lack of capital and assets are among the reasons that are seen to contribute to women's low perception of entrepreneurial opportunities (Bowmaker-Falconer & Herrington, 2020).

2.3.2 Necessity entrepreneurship

“Necessity entrepreneurship” refers to entrepreneurial activities that arise because of a scarcity of job opportunities (Jafari-Sadeghi, 2020). A weak economic climate can bring about a forced involvement in entrepreneurship. Typically, where they are poverty driven, individuals become interested in creating self-employment for survival.

Necessity entrepreneurs are individuals who are unemployed before starting the business, typically people with low capital and limited managerial skills with the tendency towards a high failure rate (Jafari-Sadeghi, 2020).

According to Botha, Nieman, and Van Vuuren (2007, p.117), “in low- and middle-income countries, South Africa being classified as the latter, many women are involved in entrepreneurship because of a lack of alternative job opportunities”.

In South Africa women’s participation in entrepreneurship increased from 27.1% in 2016 to 34.3% in 2017, which could be an indication of the necessity for women to become involved in entrepreneurship to supplement the household income (Herrington & Kew, 2018).

2.4 Entrepreneurial capabilities

“Entrepreneurial ability” is an important concept and defines the ability required to identify a new opportunity and develop the resource base needed to pursue the opportunities(Phillips & Tracey, 2007).

Entrepreneurial capabilities can be classified according to the stages of the business venture, as shown in Table 2 below.

Table 2: Entrepreneurial capabilities at different stages of a business venture (Howard et al., 2016)

Firm Stages	Entrepreneurial Capabilities
Nascent	● Risk-taking, seizing opportunities ● Entrepreneurial intentions, social capital ● Managerial experience
Survival	● Self-efficacy ● Promotion capabilities ● Business experience ● Entrepreneur's experience ● Skills and knowhow ● Social capital
Growth	● Business planning ● Growth intention ● Business and managerial experience

Digital entrepreneurship-based businesses incorporate Information Technology (IT) with traditional entrepreneurial skills. This means that entrepreneurs need both technical and entrepreneurial skills (Antonizzi & Smuts, 2020; Bogdanowicz, 2015). The success of micro enterprises is dependent on the entrepreneur's ability or resource endowment to seize opportunities. In this context, "skills" refers to the potential of learning and using the specialised traits that are important for entrepreneurial activity, that involve interactions within a social and material environment (Al Mamun et al., 2019; Peris-Ortiz, Rueda-Armengot, & Osorio, 2012). Table 2 above shows these entrepreneurial capabilities, at various stages of a business venture.

Digital entrepreneurs interact with digital technologies to propagate their innovations. The internet is designed to allow users to engage with ease (Elia et al., 2020; Sussan & Acs, 2017). Digital users are a fundamental part of the digital entrepreneurial ecosystem; agents are the entrepreneurs that carry out value-creation activities in interacting with the digital marketplace (Acs et al., 2016).

Users or consumers become the co-producers in product evolution. Users, however, require the skill and the experience to design content online and create a footprint. This capacity for use and content creation is integral to the sustainability of the digital ecosystem(Elia et al., 2020).

The higher the skill level the greater the participation and ability to co-create and add to the value chain (Elia et al., 2020). The digital citizen is unconventional and distributed, with diverse goals and motives (Elia et al., 2020; Sussan & Acs, 2017).

Content co-creation is made possible by the procreative character of digital ecosystems and their service-demand logic. Entrepreneurs create an invention as a user and tap into the skill and creativity of the network prior to commercialising. The open digital entrepreneur system allows for innovation by individuals (McAdam, 2020).

Business model creation can rely on user-produced content and obtain revenue from advertising in businesses such as Facebook. Business models can be such that users share their tangible assets, such as on Uber and Airbnb(Bican & Brem, 2020; Sahut, Iandoli, & Teulon, 2019).

2.5 Digital entrepreneurship

Digital technology brings with it a greater capacity to synthesise information instantaneously and the pursuit of opportunities with digital infrastructures known as digital entrepreneurship(Davidson & Vaast, 2010). Entrepreneurial concepts with digital content can be transformed with the use of diverse technological tools to support value creation from digital information (Sahut et al., 2019).

Digital technologies play a facilitating and mediating role in making the operations of business ventures easier (Sahut et al., 2019). The attributes of the internet as a facilitation mechanism have been shown to present an interesting resource for groups that were formerly excluded from brick-and-mortar

entrepreneurship. Digital technologies are considered to be external enablers of new ventures and to reduce the time and resources needed in creating business ventures (Sahut et al., 2019).

Digital technologies have transformed the uncertainty inherent in the entrepreneurial process. They have introduced alternative ways of dealing with such uncertainties and have given rise to the digital economy. The junction between digital technologies and entrepreneurship creates new characteristics in shaping entrepreneurial pursuit (Nambisan, 2017).

The digital economy is an ecosystem that has Information Communication Technology (ICT) as a key component powering the services, platforms and solutions that are internet-based, along with the platforms and devices from the multi-device connectivity environment that drives the digital economy (Huawei, 2017).The input technologies that entrepreneurs use have expanded the technology entrepreneurs available. The transformation of the technologies that are used extends the technologies that entrepreneurs use to create new ventures.(Fossen & Sorgner, 2019; Giones & Brem, 2017).

Technology entrepreneurship can be distinguished from digital entrepreneurship in terms of the different motivations of the different types of entrepreneurs and the financial sources of their founding behaviours that give rise to their participation in the digital economy. Table 3 shows the technology, key activities and access to resources that place and differentiate the different types of entrepreneurship in the digital economy (Giones & Brem, 2017).

Table 3: Entrepreneurship in the digital economy (Giones & Brem, 2017)

Typology	Technology Behind It	Key Activities	Access to Resources
Technology entrepreneurship	New products that are based on breakthrough research that is science based, advancing specific knowledge or emanating from academic research	Proving of technological concepts	Public funded research Academic or state funding
Digital technology entrepreneurship	ICT technologies connectivity, internet of things (IoT) devices and smartphones	Market validation of concepts through digital technologies	Business angles, seed funding and venture capital
Digital entrepreneurship	Breakthrough products based on the Internet either running on clouds or leveraging frontier technology	Technology is an input factor in high-growth ambition. Stay ahead of competitors or dominate the market	Business funded, seed funding and venture capital Stock market equity or crowdfunding

2.5.1 Women's participation in digital entrepreneurship

According to McAdam (2020), the potential of digital entrepreneurship and its low barriers give the impression that it will afford groups that were formerly excluded from traditional business a better chance in the digital economy. However, McAdam finds: "The theoretical development requires consideration of the social-economic and cultural context in which the digital engagement takes place" (McAdam, 2020, p.3). For example, entrepreneurship as a good leveller for disadvantaged individuals who were under-represented in entrepreneurship and business ownership will remain unrealised if stereotypes that expect women to be feminine even online still exist (McAdam, 2020).

In addition, the potential for technology to promote entrepreneurship for previously disadvantaged groups may be exaggerated. Digital entrepreneurship is still a resource-based activity that needs financial investment, skills and access to online markets. Equipment and technological offline disparities in terms of source access are prone to be replicated online (McAdam, 2020).

There are fewer women entrepreneurs than men globally(Foss, Henry, Ahl, & Mikalsen, 2019; Kamberidou, 2020). Societal prejudices, financial limitations and low entrepreneurship educational opportunities are significant barriers to women's chances of success(McAdam, 2020; Movahedi & Yaghoubi-Farani, 2012)

Markley, Barkley and Lamie (2007) conducted a study of rural businesses that highlighted the challenges faced by the entrepreneurs in the rural areas of the United States of America (USA). The case studies used in the study share similarities with the business sectors that are usually characteristic of South African women entrepreneurship. The case studies highlight the major challenges associated with adopting a digital business strategy, a lack of skills for online presence, website building, e-commerce platform business understanding and availability of the skills required in the market(Markley, Barkley, & Lamie, 2007) .

2.5.2 Academic digital entrepreneurship

Universities are key institutions in any innovation system in addition to their conventional businesses of teaching and research (De Silva, 2016). An academic entrepreneur is described as “an academic whose prime activity previous to performing a position of entrepreneur was a teacher or researcher affiliated with an academic institute” (Rahim, Mohamed, & Amrin, 2015.p54).

Academic entrepreneurship is the intersection of academic research and commercialisation. It involves academic research concepts that are commercialised and turned into innovative business. Academic digital entrepreneurship is defined as “the process universities adopt to achieve their entrepreneurial configuration” (Secundo, Rippa, & Cerchione, 2020, p.1),.

The intellect and skills of the academic entrepreneur are the fundamental qualities that define their role in academic digital entrepreneurship. These qualities allow them to recognise technological opportunity, capitalise on commercial opportunities and promote technologically advanced products (Rahim et al., 2015).

According to Abreu and Grinevich (2017), women in academic institutions generally hold junior positions in the social sciences fields such as health, humanities and education. These authors found that women academics have less entrepreneurial skill and are hesitant to commercialise research. Women in academia differ from the men in several aspects: they gravitate to making sensible decisions and participating in research fields that tend to be social and non-profit(Abreu & Grinevich, 2017).

The low positions held by women academics and their lack of entrepreneurial experience severely constrain their opportunities for commercialisation. Other potential constraints include the lack of industry experience and greater reliance on institutional support(Abreu & Grinevich, 2017).

2.5.3 Business digital entrepreneurship

Capital gains motivate business entrepreneurs, whose primary goal is growth and financial gains within the business world. They continuously try to capture market share from a competitive marketplace. This entrepreneurship is opportunity driven, creating ventures and driving innovation. For Howard et al. (2016), business entrepreneurs establish enterprises or digitise a traditional business, such as Amazon.com (Davidson & Vaast, 2010). Business entrepreneurs find gaps between similar groups of people and position themselves to capitalise on these opportunities by recognising and pursuing innovative ideas and transforming them into viable opportunities (Antonizzi & Smuts, 2020).

In the past, entrepreneurial firms have been male dominated. With women struggling to break the glass ceiling and run their own business, a gap still exists in entrepreneurship (McAdam, Harrison, & Leitch, 2019; Peris-Ortiz, Ferreira, & Fernandes, 2018). Women entrepreneurs require support from businesses and organisations to gain experience and be able to recognise opportunities offered them by digital technologies (Peris-Ortiz et al., 2012).

Arising out of the literature reviewed on the area of digital entrepreneurship and the participation of women in this type of entrepreneurship, the first research question was formulated.

Research Question 1

What are the features of women's participation in digital entrepreneurship in Gauteng Province, South Africa?

2.6 Entrepreneurship ecosystem

Entrepreneurs are heterogeneous and are classified by their attributes, such as their demographics, business strategies and lifestyle choices. The probability of entrepreneurial success depends on the environment in which the entrepreneur

operates, and this is known as the entrepreneurial ecosystem(Mujahid, Mubarik, & Naghavi, 2019).

An “entrepreneurial ecosystem” refers to a synergy of system conditions and structure that takes into consideration abiotic (non-living) and biotic (living) components of the ecosystem. Ecosystem conditions such as networks of entrepreneurship leadership, investment technology and expertise services are at the heart of the entrepreneurial ecosystem(Nambisan & Baron, 2019; Wright, Nambisan, & Feldman, 2019). It is important to analyse the relative contribution of each of the factors and conditions that make up an entrepreneurship ecosystem in order to devise an optimal policy that promotes entrepreneurial ventures. Studies suggest that external environmental factors have a strong influence on survivability, profitability and entrepreneurial success (Mujahid et al., 2019).

One important component of the entrepreneurial ecosystem is the provision of resources. An understanding of the entrepreneurial ecosystem is important as a supporting structure for economic development. Business survival depends on the provision of financial and professional resources by the entrepreneurial ecosystem (McAdam, 2020).

The regulatory framework and infrastructure are also conditions of the environmental ecosystem that affect the level of entrepreneurial activity in a country, with factors such as the availability of finance, mentors and institutional support, including training in managerial skills. Whilst ecosystems impact all entrepreneurs, some of their components may impact women more than men, depending on the country's policy and regulatory frameworks (Foss et al., 2019)). Policy is the cornerstone of any entrepreneurial ecosystem as it affects the ecosystem at the macro level, which subsequently affects the entrepreneur and any new ventures they seek to pursue (Foss et al., 2019).

One of the objectives of the current study is to analyse the entrepreneurial ecosystem factors at a macro level that potentially affect the participation of

women in digital entrepreneurship, with the aim of looking at the attributes of an entrepreneurial ecosystem that promote entrepreneurial activity.

Central to the study is the entrepreneur in the digital era exploiting opportunities through the use of digital artefacts or digital media platforms. This entrepreneurship occurs in a multi-disciplinary environment composed of the entrepreneur, society and institutions (Nambisan & Baron, 2019). The understanding of factors that affect the entrepreneurial activity in the digital world is central to the study because it provides the contextual factors that affect the participation of women in entrepreneurial activity.

In their review of entrepreneurial research, Cavallo et al. (2019) concentrate on the characteristics and behaviour of individuals and firms, emphasising the importance of relationships between entrepreneurs and their local environments. However, thus far no holistic approach has been explored (McAdam, 2020).

2.6.1 Entrepreneurial ecosystem in South Africa

The evolution of technology has changed the way people live and do business. The ability to embrace digital technology and transformation marks the difference between underdeveloped and developed countries. The difference in the transformation between countries makes it important for the researcher to look at digital entrepreneurship in context, in this case the African and South African context.

The national digital entrepreneurship capacity depends on contextual factors such as a supportive innovative system in which governmental strategies, business and educational institutions work together.

The success of entrepreneurial processes depends on the quality of the surrounding ecosystem and the social setting in which the processes operate, which presents opportunities that result from digital entrepreneurship. One has to look at Africa in context to assess whether the economies in Africa can

optimise the opportunities that are afforded by the digital economy (Trade law center, 2019)The African digital ecosystem differs from the global or developed world ecosystems. Innovation and entrepreneurship take place in the same system since entrepreneurship is social and economic and involves organisations and groups of individuals. Understanding the entrepreneurial ecosystem can explain the differences in the development of different cities, with certain cities and regions generating more money and being more productive than others (Trade law center, 2019).

Most digital entrepreneurship research has focused on digital platforms (Boeker, Howard, Basu, & Sahaym, 2019; Song, 2019; Srinivasan & Venkatraman, 2018; Wright et al., 2019). However, most digital businesses are micro to small and in developing countries are locally established. The vast difference between cities means that an entrepreneur starting a business in London will have different challenges from an entrepreneur in Lagos or Johannesburg.

African cities experience particular challenges. The Digital Economy Report of 2019 has identified ecosystem bottlenecks that affect African digital businesses, starting with small and fragmented local digital markets, that make it difficult to scale and access the global market (Fredriksson et al., 2019).

In Africa, business focus is on the domestic market and caters to a nearby niche market. African outsourcing is much smaller and less efficient than in South Asia, for example. Market fragmentation is also exacerbated because digital businesses have to engage with customers directly (Fredriksson et al., 2019).

Digital entrepreneurship requires both technical and entrepreneurial skills and entrepreneurs need this dual ability (Satalkina & Steiner, 2020). Digital businesses rely on creative skills brought in by digitally skilled personnel, resulting in the emergence of a new class of professionals. The dynamic working environment in a start-up business requires soft skills that local university graduates cannot offer, such as creative skills and critical and

independent thinking. These skills are also mostly lacking in developing countries (Satalkina & Steiner, 2020).

Access to finance in developing countries is exceptionally low. Financial institutions are reluctant to provide capital to digital start-ups because of the considerable risk that is involved; most start-ups lack the possessions that may serve as surety (Trade law center, 2019)

The challenges that are experienced by entrepreneurship in Africa are mirrored in the South African context, with entrepreneurs in South Africa experiencing challenges such as high data costs that lead to lack of access, an inadequate education system that is not catering for the dual-mastery characteristics of digital entrepreneurship and a lack of access to finance (Elam et al., 2019).

While South Africa is one of four countries in Africa that represent about 60% of the innovation concentration and entrepreneurship activity, with the other countries being Kenya, Nigeria and Egypt (Fredriksson et al., 2019), South Africa still has some way to go towards developing entrepreneurship as a significant driver of economic development and job creation.

South Africa has so far not realised the potential derived from the rapidly growing digital economy. In recent decades a swift growth in the participation of education has been reported but the standard is not improving, and the educational system is unable to respond to the skills' needs of the digital economy (Bowmaker-Falconer & Herrington, 2020; Elam et al., 2019)

According to GEM (2019), the South African market is dominated by monopolies, which is detrimental to the small business sector. Market access is currently prejudiced in favour of large companies. However, the government is attempting to promote entrepreneurship, with the Small Enterprise Finance Agency (SEFA) one of several South African government state-owned enterprises (SOEs) that support small businesses financially and provide incubators that stimulate entrepreneurial activity(Bowmaker-Falconer & Herrington, 2020; Lose & Tengeh, 2015).

On innovation and competitiveness, the ecosystem has to be accessible to all. On the (Elam et al., 2019) global ratings, South Africa scored lower than 4, which shows an unhealthy market environment (see Figure 3).

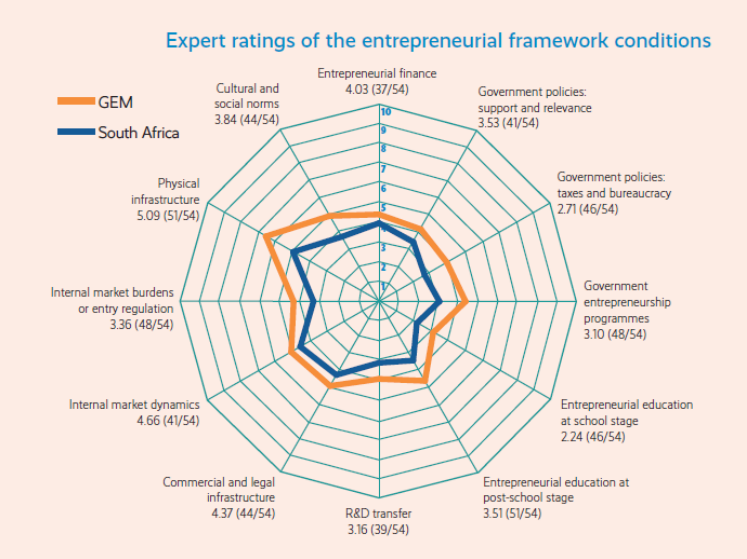

Figure 3: South Africa 2019 expert rating of entrepreneurial framework conditions (GEM, 2019)

2.7 Digital entrepreneurship ecosystem

A digital entrepreneurship ecosystem (DEE) can be described as a system of systems made up of elements such as the marketplace, users and digital infrastructure. The systems interact to achieve a common goal. “An ecosystem is a set of actors with varying degrees of multilateral, non-generic complementarities that are not hierarchically controlled” (Sahut et al., 2019, p.11). Research has put intense focus on institutional aspects of a country-specific environment. The context plays a critical role and Geissinger et al. define digital ecosystems as “social-technical networks of connected digital technologies and related players that are affected, based on a specific context” (Geissinger et al., 2019, p.433).

The elements of the DEE have not been empirically tested and the validity of the elements of the systems is still to be explored. An understanding of the DEE elements will highlight the necessary elements or the important factors that must be assessed to facilitate or promote the participation of women in digital entrepreneurship (Torres & Godinho, 2021). The elements of regulation, digital infrastructure governance, digital business platforms and the digital marketplace, which form the macro level of the ecosystem in Sahut et al.'s (2019) Digital Ecosystem Conceptual Framework, are discussed below.

2.8 Theoretical foundation: theoretical framework

A theoretical framework is a conceptual structure that organises ideas systematically and identifies relevant variables and the components that make up an area of interest in relation to each other. It offers the researcher a foundation on which to build hypotheses and test theory (Kuratko et al., 2015). The theoretical framework provides a guideline that the study can follow to measure or close the gaps identified in the literature review and answer the research questions derived from the literature review. In this section relevant theories and frameworks are described in terms of their potential usefulness as a guide for the study.

2.8.1 An integrated approach

For entrepreneurship to take place, the variables of the entrepreneur, the environment and the process of value creation need to interact in a certain context (Kuratko et al., 2015). The complexity of the DEE dictates that a multi-disciplinary approach to the current research is needed to achieve a complete understanding of the digital entrepreneur at the macro- and micro levels and to assess the participation of women in the digital economy (Galawe, 2017).

Satalkina and Steiner (2020) posit that digital entrepreneurship is not limited to the precise results of a venture process but is a multi-dimensional concept that

connects distinct components from supply chains within different innovation systems (Satalkina & Steiner, 2020).

The multi-disciplinary nature of digital entrepreneurship supports the system thinking approach by bringing in multi-layered interdependencies and interrelationships. There is a need for understanding the impact of such a system on women's participation in digital entrepreneurship further (Galawe, 2017).

2.8.2 Entrepreneurial frameworks

Traditional frameworks in entrepreneurship assume relatively stable and fixed boundaries whilst digital entrepreneurship imply fluid boundaries. Framework measures profile the context for entrepreneurial activity and tend to capture formal institutions and tangible structural conditions (e.g., education level of the population; quality of regulations and entrepreneurship policy interventions; and the availability of resources for entrepreneurship, (Nambisan, 2017).

A list of frameworks relevant to entrepreneurship has been adapted from Bogdanowicz (2015) as follows:

- The Entrepreneurship Indicators Programme (EIP)
- The EIP demographic statistics
- Global Entrepreneurship Monitor (GEM)
- The Global Entrepreneurship and Development Index (GEDI/GEINDEX)
- The Regional Entrepreneurship Monitor
- The Community Innovation Survey
- Enterprise Survey (World Bank Group)
- Doing Business
- EU Flash Barometer Survey on Entrepreneurship

- Panel Study of Entrepreneurial Dynamics (PSED)
- The Comparative Entrepreneurship Data for Internal Analysis (COMPEDIA)

The traditional frameworks have little linkage to, or acknowledgement of, the role played by digital technologies. The majority of the frameworks focus on the creation of firms and use of resources, with the Schumpeterian view placing the entrepreneur as the locus of entrepreneurial activity within existing firms (Bogdanowicz, 2015).

The frameworks lack the innovative aspects associated with digital entrepreneurship and none recognises the impact of digital technologies. Omitting ICT or digital technologies provides little support for digital entrepreneurship or for policy making using the current empirical frameworks (Bogdanowicz, 2015).

The limitation in the entrepreneurial frameworks calls for a new measurement framework that could be used as a foundation for the building blocks to a digital entrepreneurship policy (Bogdanowicz, 2015). One of the entrepreneurial frameworks listed above, the GEM Framework, uses relevant indicators that can serve as a basis and inspiration for the elaboration of a measurement framework that targets digital entrepreneurship. This framework is considered as a separate theory below.

2.8.3 The Global Entrepreneurship Monitor Framework

The GEM Framework aims to produce internationally comparable data on entrepreneurial activity. The GEM project uses observational data to evaluate the level of entrepreneurial activity across countries (Bogdanowicz, 2015).

The Framework addresses innovation at three levels: as a context, as entrepreneurial aspiration and as socio-economic development (Bogdanowicz, 2015).

The GEM Framework supports an interdisciplinary, multi-dimensional and comprehensive approach to an integrated model framework. According to this framework, the development and impact of digital entrepreneurship vary depending on different socio-economic conditions, which determine distinct patterns of digital transformation and digital economic activity.

The GEM indices provide measurements for specific categories such as ICT, the digital economy and digital risk, and other socio-economic indicators. The Framework uses a systematic way of interpreting the impact of entrepreneurship in different contexts, which can be applied to digital entrepreneurship to provide a methodical way of interpreting the impact of digital entrepreneurship on the innovation process and societal transitions.

The GEM Framework measures the attributes that promote entrepreneurial activity such as risk-taking, access to mentorship or knowledge of a mentor, social and cultural norms, and government policy. The Framework provides guidance on the current South African status of entrepreneurial activity and factors that affect women's participation.

The Framework, however, does not cover the creation of a digital value chain and the factors specific to the digital entrepreneurship.

The GEM surveys sample businesses that have workforce of above 20. the global number of respondents with 20 or more employees is at 2.5%of women entrepreneurs and 5 % of the men entrepreneurs have more than 20 employees(Bowmaker-Falconer & Herrington, 2020).

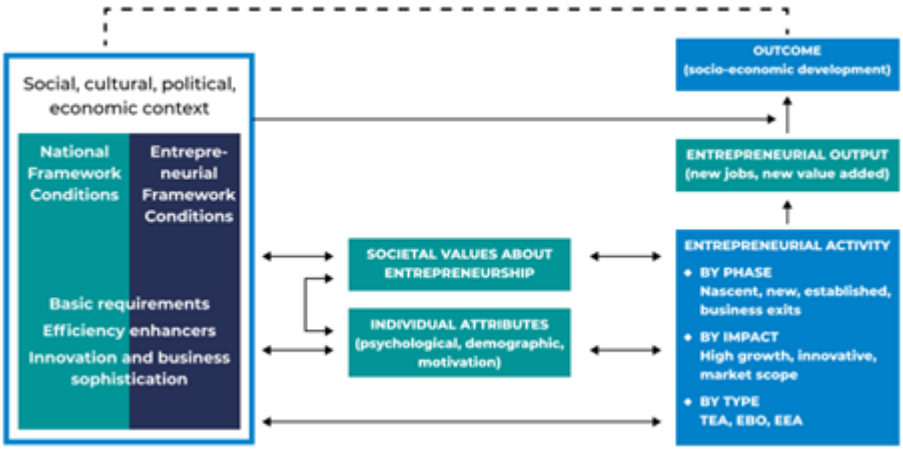

Figure 4: Global Entrepreneurship Monitoring Framework (Bogdanowicz, 2015)

2.9 Conceptual framework

The conceptual framework is an organised structure that links the literature and research objectives. An integrated approach of looking at the research questions informing the research project. The conceptual framework defines the approaches and proposes the relationships among the concepts studied(Adom, Hussain, & Joe, 2018).

2.10 Macro-Level-Ecosystem

The digital transformation caused by frontier technologies has brought about new functionalities and different competitive environments and has introduced new business strategies, structures and processes. Digital technologies are changing the shape and size of organisations and giving rise to new ways of collaborating and leveraging resources. However, although the opportunities created by digital technologies are enormous, they also bring challenges (Beliaeva, Ferasso, Kraus, & Damke, 2020; Sahut et al., 2019; Zhao & Collier, 2016).

To address the challenges rising from the technologies and harness the opportunities that the technologies present, a different framework or measure is

required to capture the impact of the technologies on the current entrepreneurial activities. There is, thus, a need to explore a conceptual framework that better captures the opportunities and benefits that can be derived from digital entrepreneurship (Zhao & Collier, 2016).

There are fundamental questions that the GEM Framework is unable to answer that relate exclusively to digital technologies. For example, it can be questioned whether digital technologies have transformed entrepreneurship and reduced the barriers and challenges that were previously encountered in accessing or operating in an entrepreneurial environment.

The development and impact of digital entrepreneurship differ in regard to the various socio-economic conditions and challenges, and in the identification of challenges regarding the required conditions for the creation of and participation in digital entrepreneurship. To understand these determinants, there is a need to understand the entrepreneur, the entrepreneurial process or digital value chain, and the ecosystem in which the value is being created (Satalkina & Steiner, 2020a).

The framework followed in the current study is the Digital Ecosystem Conceptual Framework developed by Sahut et al. (2019). This framework is general enough to be used to analyse the challenges that may be encountered in the value-generation process at the entrepreneurial or micro level and still capture the socio-political context at the macro level, looking specifically at factors that are related to digital technology. Digital ecosystems are complex system dynamics of interdependent socio-technical elements, including digital ecosystems, institutions and customers. The digital ecosystem comprises heterogeneous players and technologies from several enterprises. They overlap a wider ecosystem that supports general-purpose internal smaller and more specialised ecosystems (Geissinger, Laurell, Sandström, Eriksson, & Nykvist, 2019).

2.10.1 Regulatory institutions

Institutions are a fundamental aspect of any entrepreneurial ecosystem, including the digital entrepreneurial ecosystem, with economic institutions affecting the structure of the ownership of assets. Institutions are effective market frameworks because of their influence on the structure of economic incentives and they play a vital role in the allocation of resources to their effective use (Fossen & Sorgner, 2019).

Regulatory institutions uphold the operational “rules of the game” in society for entrepreneurship. The reputation and efficiency of regulatory institutions matter as they affect the level of alleged dishonesty and the general regulatory framework in context (Stam & van de Ven, 2021).

Regulatory institutions specify the fundamental requirements for economic facilitation and for resources to be used productively. In addition, they dictate the manner in which entrepreneurship is pursued and the benefit consequences of entrepreneurship (Stam & van de Ven, 2021).

2.10.2 Digital infrastructure governance

Digital infrastructure is a socially fixed mechanical system that comprises technologies and human factors. It is made up of networks, structures and processes. A self-reinforcing loop, it is diverse and constantly changing. Digital infrastructure has no definition or boundaries and is a decentralised, shared and distributed system (Sussan & Acs, 2017).

Digital infrastructure governance is the coordination and administration essential for competitiveness. Infrastructure administration deals with issues such as digital privacy, security, access to infrastructure, and the balancing of power between big industry and users (Sussan & Acs, 2017). As the digital infrastructure system works from the bottom up, it provides a challenge to policy makers for governance.

2.10.3 Digital business platform

Digital entrepreneurship differentiates amongst the controlled and platform economy by introducing a platform-based ecosystem. In comparison with entrepreneurial ecosystems, and with the function of internet based, platform ecosystems are not confined by geographic locations with multitudes of users and agents. Platform-based ecosystems are developed and nurtured not by countries but by platform organisations. Ecosystem governance, are decided by the owners of the platform (Ács et al., 2019; Acs et al., 2017; Roundy, Bradshaw, & Brockman, 2018; Song, 2019).

2.10.4 Digital marketplace

The digital marketplace is a novel and alternative form in the digital economy that enables new types of transactions to take place. This marketplace is a cornerstone of the digital ecosystem as it provides the means to connect users and service providers. The digital marketplace matches buyers and sellers through digital technologies (Fradkin, 2020).

The digital marketplace allows doing business at low cost by both professional and ordinary people. The marketplace is characterised by no obligation and non-exclusive contracts that give the users flexibility coupled with direct transactions between buyers and sellers (Fradkin, 2020).

The marketplace has incentives to protect the privacy, implement property rules and govern accessibility of all components of the digital system. Marketplaces attract and coordinate diverse and independent customers and entrepreneurs and bring together diverse and independent market users (Sahut et al., 2019).

On the basis of the review of literature on the entrepreneurial ecosystem and the digital entrepreneurial ecosystem, in particular, the following research question was formulated.

Research question 2

What macro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?

The following section focuses on the factors that affect the entrepreneur during the value-creation phase of Sahut et al.'s (2019) framework (see Figure 4 below). The study focus is on the participation of women and this has dictated and elevated the importance of factors considered to affect the entrepreneur directly in the value-creation process.

2.11 Micro-Level Ecosystem

2.11.1 Challenges

Contributions in literature have identified a considerably innovative trait in digital entrepreneurship, in its systematic and incorporating nature. The merger of the entrepreneurial ecosystem (see Section 2.6 above) and digital ecosystem (see Section 2.7 above) provides a framework for conceptualising digital entrepreneurship on the basis of four key elements: policy, infrastructure governance, digital marketplace and digital entrepreneurship (Sahut et al., 2019).

Sahut et al. (2019) base their suggested framework, the Digital Ecosystem Conceptual Framework, on three assumptions. The first assumption is that the fundamental effect of the digital entrepreneurial ecosystem is the human ability to synthesise and absorb information at great rates and speed. The second assumption is that the establishment of value occurs with the production of digital information, and the third assumption is that the synergies and transactions of information among individuals on digital platforms generate opportunities for those who recognise them (Sahut et al., 2019).

Threats are classified as challenges and conflict, depending on where they manifest. To counter potential threats, Sahut et al. (2019, p.4) identify "digital socio technical enablers that entrepreneurs can exploit to address the

challenges and frictions in each phase". The challenges and enablers are discussed below.

Information acquisition and synthesis present a challenge that entrepreneurs encounter because of various factors in their ecosystem. These challenges can range from cost of access and the quality of the information available to an information overload that requires a certain level of skill to synthesise.

Data collected from online sources such as weblogs and social media, and traditional enterprise data make up what is defined as "big data". This is large amounts of data that is both structured and unstructured in various formats. Big data presents a challenge in terms of storing, processing and analysing it.

Big data is characterised by volume, velocity, variety and veracity. The data has to be verified and analysed for quality to avoid fake data. The data generated is too large to be analysed by ordinary software programs such as MS Excel and requires specific programs for analysis.

The data collected needs to be synthesised in order for a digital entrepreneur to use it for decision making and opportunity persuasion (Lundberg, Quist, & Magnusson, 2018). The visualisation of big data analytics can be a challenge for decision making and maximisation of the use of the data (Lundberg et al., 2018).

Business model design formulation and conceptualisation can pose a challenge to an entrepreneur that does not have an adequate skill set or knowledge that enables them to conceptualise the business model. Digital entrepreneurship requires the appropriate technological skills to implement and manage the business online. This is a dual-mastery skill set as it requires the mastering of both managerial and technical skills.

The ability of an entrepreneur to perform repeatedly a productive task that results in the capacity to create value through transforming their input is a skill necessary for digital business performance and survival (Ritter & Pedersen, 2020).

The digital entrepreneur needs to build user communities and have an online following, which is critical to the online business and marketplace. This means that network centrality factors will affect the success of any digital business that is being pursued. Digital literacy and digital design skills are two of the critical factors that enable target identification, access to markets and scaling the business, and value demonstration to the online community in relation to marketing and sales activities (Ritter & Pedersen, 2020).

The new venture concept requires a distinctive set of functions that find business opportunities and develop and evolve capital for resources. Boeker et al. (2019) show that goodwill and resources arise from this network of networks with allies, associates, family and other businesspeople. Entrepreneurs rely on their networks and connections for information, advice and signalling (Ritter & Pedersen, 2020; Srinivasan & Venkatraman, 2018).

The multichannel communication and networks can assist in information acquisition regarding emerging technologies, available skills or market conditions before they are public knowledge. The endorsement and mentorship capacity of social capital is another gain for the entrepreneur and can help build legitimacy through recommendations and mitigate perceived risk, especially in a start-up phase (Lux, Macau, & Brown, 2020; Srinivasan & Venkatraman, 2018). From reviewing the challenges encountered by entrepreneurs in creating value, the following research question was derived.

Research question 3

What micro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?

2.11.2 Barriers and frictions

Barriers are difficulties that inhibit growth, hurdles that hinder entrepreneurs in the running of the business or the struggle that occurs during normal business processes.

Frictions can be defines as the factors that will determine the speed and ease of doing digital business or the facilitation of digital transactions(Sahut et al., 2019; Satalkina & Steiner, 2020a).

Micro-level digital ecosystem factors will affect women's participation in digital entrepreneurship. The entrepreneur's ability to access data and synthesise it to create value, along with factors such as data cost, availability of networks for information sharing and mentorship, crowdfunding in the instances where financial backing is required and the skills to conceptualise the business idea into a value proposition, involves specialised skills and knowledge that women may lack access to.

Access to talent and a particular quantity of available experienced labour is crucial for the accomplishment of new ventures and presents a barrier for digital entrepreneurship. These diverse talented professionals must have expertise that enables them to cope well with the particular demands of working at a small firm. The necessary qualifications and skills may comprise technical, managerial, market intelligence and correlation with customer networks. The availability of digital skills such as website design, data analytics and IT professional skills are crucial to a digital business (Lux et al., 2020). These considerations give rise to a fourth research question.

Research question 4

What micro-level digital entrepreneurship barriers and frictions affect the participation of women in entrepreneurship in Gauteng Province?

2.11.3 Digital socio-technical enablers

Digital socio-technical enablers that entrepreneurs can exploit to address the barriers and frictions in the value-creation process are factors such as mentorship, crowdsource funding, learning communities and networks (Sahut et al., 2019). A challenge that entrepreneurs face at the inception of their entrepreneurial initiative is to obtain finance, given the lack of assets and

sufficient cash flows and the presence of significant information asymmetry with investors. Crowdsource funding can be defined as raising money from a group of individuals to fund a project (Schwienbacher & Larralde, 2012).

Networking is one of the social enablers of digital entrepreneurship. The early-stage networks of enterprise founders are important to the acquisition of resources for start-up success (Smith & Smith, 2019). From the above considerations, the fifth research question for the study was developed as follows.

Research question 5

What are the socio-technical enablers of digital entrepreneurship that may support the participation of women in the digital entrepreneurship economy of Gauteng Province?

Sussan and Acs (2017) suggest that the exclusion of the impact of the role of digital technologies and the role played by agents presents a substantial gap in the understanding of entrepreneurship theory. The authors combine the digital ecosystem and entrepreneurial ecosystem with the aim of capturing the missing aspects in the empirical entrepreneurship frameworks and providing a measure of digital entrepreneurship. The conceptual framework has four crucial concepts: digital user citizenship, digital infrastructure governance, digital marketplace and digital entrepreneur (Sussan & Acs, 2017).

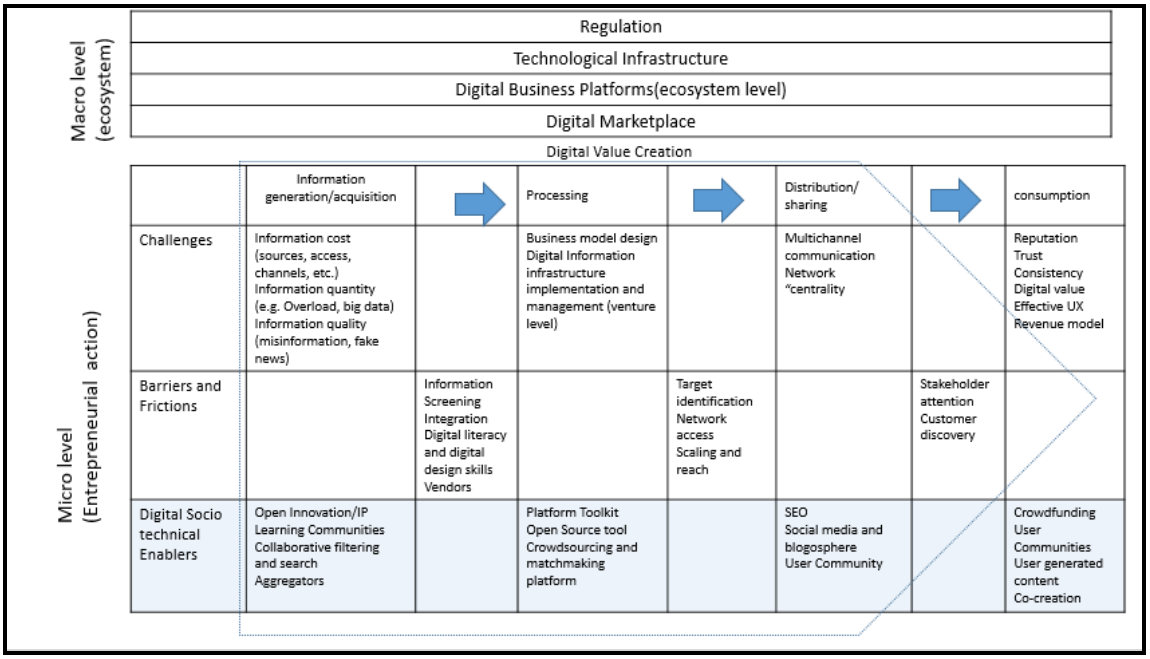

Figure 5: Digital Ecosystem Conceptual Framework (Sahut et al., 2019)

2.12 Research questions

Five research questions were drawn up from the literature reviewed to guide the study:

1. What are the features of women's participation in digital entrepreneurship in Gauteng Province, South Africa?
2. What macro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?
3. What micro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?
4. What micro-level digital entrepreneurship barriers and frictions affect the participation of women in entrepreneurship in Gauteng Province?
5. What are the socio-technical enablers of digital entrepreneurship that may support the participation of women in the digital entrepreneurship economy of Gauteng Province?

2.13 Conclusion of the literature review

The definition of the entrepreneur has developed over time to include digital entrepreneurial activities. There is a recent shift in research that reconceptualises an entrepreneur from the occupational notion of someone who manages and decides how to allocate and use resources and take risks to someone who uses digital technologies that transform economies into digital economies.

Table 4: Shift in conceptualisation of entrepreneurship

Research Streams	Definitions	Articles
Entrepreneurship	Owning and operating a business Entrepreneurship as an individual who specialises in carrying out subjective decisions about the allocation of a limited resource	(Davidson & Vaast, 2010) (Ács, Szerb, & Lafuente, 2019)
Digital economy with entrepreneurship	This refers to entrepreneurship in the digital era	(Davidson & Vaast, 2010)
Technology entrepreneurship	This refers to the input impact of digitisation on entrepreneurial processes, outcomes and opportunities	(Nambisan & Baron, 2013) (Nambisan, 2017)

Digital entrepreneurship is defined as a subcategory of entrepreneurship. This classification is an interest of research because of the differences between digital entrepreneurship and traditional entrepreneurship. Of interest is how business opportunity is realised and capitalised on in digital entrepreneurship.

Using digital technologies gives rise to a range of entrepreneurship categories. At one end of the scale is academic entrepreneurship, where academic

research concepts are turned into innovations that are economically viable and can be tested. At the other end of the scale is knowledge entrepreneurship, where skilled individuals use their knowledge to generate financial benefits and monetarise their knowledge through digital media platforms such as blogs, YouTube channels and Instagram.

The concepts “technology entrepreneurship”, “digital technology entrepreneurship” and “digital entrepreneurship” are often used interchangeably. To place digital entrepreneurship as the basis of this research, these concepts were investigated further.

Literature differentiates these areas by the technologies that drive them. Technology entrepreneurship is defined as introducing a new product to the market from research that primarily proves the concept and is mostly public or corporate funded, while digital entrepreneurship is the use of new products and services based purely on the internet leveraging frontier technologies. However, the lines between technology, digital technology and digital entrepreneurship are blurred, with the biggest differentiator being the motivation behind the entrepreneurial activity (Giones & Brem, 2017).

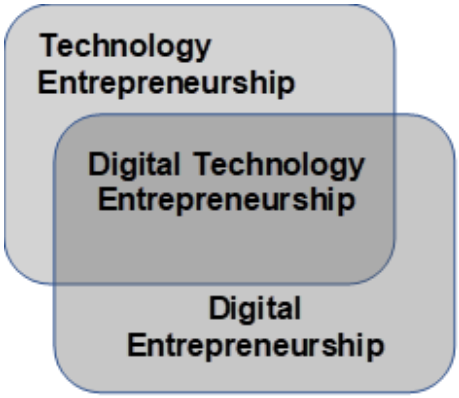

Figure 6: Technology-based entrepreneurial relationship (Giones & Brem, 2017)

Recent research on the impact of the social embeddedness of digital entrepreneurship gives rise to the concept of the DEE. This ecosystem comprises different actors at different levels and is multi-disciplinary (Galawe, 2017).

Research shows the study of entrepreneurship to be integrated and multi-disciplinary. These characteristics point to a systems theory as a useful theoretical framework to capture that different actors influence the flourishing of the ecosystem and are interrelated. Factors such as policy, market conditions and infrastructure availability affect the ecosystem at the macro- and micro levels.

The systems approach is the most suitable approach for the assessment of digital ecosystems and their interdependent factors, such as the marketplace, policy, infrastructure and digital entrepreneurs. The interdependence of the systems and their influence on the success of opportunity creation and survival can be best explained by systems theory.

The ecosystem is context dependent, which means that developing countries have differing dynamics from the developed markets. The African ecosystem is characterised by challenges regarding digital infrastructure, fragmented markets, a lack of access to finance and a low level of skills. These challenges are mirrored in South Africa.

Sahut et al. (2019) find that entrepreneur research has not covered constraints that limit the ability of a digital ecosystem to synthesise data and build a digital value chain. In response they have developed a digital ecosystem conceptual framework. The framework looks at the macro-environment, such as the e-commerce platform, policy and regulatory issues, technological infrastructure and the digital marketplace. For the micro-environment, the framework presents the value proposition through various steps such as information generation and acquisition up to the consumption stage.

The framework at the entrepreneurial level highlights the challenges that affect the entrepreneur in the ecosystem. These include the challenge of synthesising big data into a resource required to advance business discussions, restricted access to data because of cost, and the quality of the data.

The business model or the way of doing business in the digital ecosystem requires the individual to have both digital and managerial skills, which is a dual-mastery skill set. The successful implementation and management of a digital business depend on the individual's skill level and their social capital and network centrality.

Barriers include the need for and difficulty in obtaining digital skills at a technical operational level that will give the digital entrepreneur the ability to create valuable content and the analytical skills required to capture the value of data created online. In addition, social skills that enable networking and the building of social capital are important at the start-up stage.

The participation of women in entrepreneurship is linked to increased social wealth and economic prosperity. This presents a barrier in a country like South Africa, which is characterised by high unemployment and low economic activity.

The low barriers to entry and low operating cost characteristic of digital entrepreneurship should potentially lead to an increase in the TEA of women in South Africa as a way of finding alternative forms of employment.

The digital marketplace has shifted in favour of entrepreneurs, with the reduction of cost through partnership enhancing the number of options available. New ventures can be created and apportioned to different actors in the ecosystem.

McAdam (2020) argues that there could be an exaggeration in the general view that digital technologies reduce the barriers to entry and facilitate entrepreneurship activity among women. Digital entrepreneurship is resource driven and requires skills and capital to start a digital business. The inequalities that exist in the offline environment will be mirrored online and thus lead to the

lower participation of women in the digital economy. This view is central to this study in its attempt to provide an understanding of the participation rate of women and the challenges faced by women in Gauteng particularly.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Research approach

The study was guided by the ontological philosophy that seeks to answer the research questions from the participants' perceptions through the voices of the participants (Creswell, 2007, 2018).

The study followed the qualitative approach to allow the understanding of meaning from people statements. The study seeks to understand the nature of the phenomenon studied from the reality as interpreted by study participants. Central to the method is to learn about the factors that affect the participants and address the research questions by collecting insights from the data (Creswell, 2018).

Using a qualitative approach allowed the study to begin with propositions and use a conceptual framework to answer the research questions developed. The qualitative approach to inquiry was adopted for the collection of data in a natural setting.

The suitability of the qualitative approach was qualified by its ability to allow the data to be collected from outside of the phenomenon being investigated and to ensure the inclusion of participant voices as part of the research report (Williams, 2007).

The qualitative research approach was considered suitable for the study in that it would enable the capturing of a high level of detail about the actual experiences of the respondents from their own viewpoints.

3.2Research design

A research design is a comprehensive plan for a study aimed at answering specific research questions. The research design dictates the procedure to

follow during the study processes of data collection, instrument development and sampling (Bhattacherjee, 2012). The qualitative approach dictated the procedure to follow during the current study (Galawe, 2017). The research design chosen for the study was a phenomenological design using an online self-administered questionnaire.

A cross-sectional study observes data from a specified population on one specific occasion. The participants in this type of study are selected on the basis of being women entrepreneurs in Gauteng Province. In accordance with Cherry (2019), a survey questionnaire with open-ended questions was distributed through the internet. The questions were standardised to collect the data that could answer the research questions in a systematic manner (Bhattacherjee, 2012).

The open-ended questionnaire allowed for the collection of rich data from participants' experiences and helped answer the research questions (Creswell, 2018).

The survey method was chosen because of its suitability for descriptive research and for studies that use a participant as the measure of analysis. The online survey method is unobstructed; an online survey provides convenience in terms of the time and place as the respondents can take the survey remotely. This was useful in the current study, given the social distancing conditions in which the research was undertaken as a result of the state of emergency regulations to counter the Covid-19 pandemic.

The disadvantages of the method are a range of biases that the survey can be subjected to. These are a response bias on the part of respondents that take the survey, a sampling bias with the chosen social desirability, and a recall bias (Bhattacherjee, 2012).

3.3Data-collection methods

The data-collection method was a Qualtrics online self-administered survey. No comprehensive database with a list of businesses or a gender-specific business database was found. This meant that participants were sourced through social media platforms. Snowballing of the participants was also used to further expand the reach of candidates not in the public media domain.

The participants were selected by using filters that targeted women entrepreneurs in Gauteng. These included Facebook business forums that were specifically aimed at women participants advertising their businesses online and in Gauteng.

Subsequent to the selection of the participants, a link was posted on LinkedIn and Facebook requesting the women entrepreneurs to participate in the study. The link was accompanied by a letter explaining the details of the study.

3.4Population and sample

3.4.1 Population

The population of the current study was made up of women-owned businesses taking part in digital entrepreneurship in Gauteng. These were businesses in which digital technologies enabled with a service or part of a business model integrated in digital technologies in a way that is core to the vital to the business operation.

A woman-owned business was characterised as one in which one or more women owned at least 51% of the company's stock or, in the case of a publicly traded company, at least 51% of the shares; and one or more women controlled the company's management and daily business operations (Botha, Nieman, & Van Vuuren, 2007; Chinomona & Maziriri, 2015)

3.4.2 Sample size

For a qualitative study the objective is to identify themes in the data set rather than to quantify magnitudes. The main aim is to ensure a sample size that is large enough to provide a new and rich-textured understanding of experiences in order to develop a well-saturated theory. Creswell (2002) suggests 2 to 30 participants. The study target sample size was 30 women entrepreneurs from Gauteng Province.

The lack of a comprehensive sex-disaggregated database on business entry and ownership presents a significant obstacle to the global and diversified analysis of female entrepreneurship (Meunier, Krylova, & Ramalho, 2017). The challenge presented by the lack of a database is access to women entrepreneurs to target and the possibility of limited sample size achievement. In addition, the ability to track reported sex-disaggregated TEA rates and accurately measure their increase or decrease at any given time is made difficult.

Study participants were sourced through social media research. The sample of female entrepreneurs was selected through websites, such as Women in Business network association sites, and digital business newspapers and magazines, and through general search engines such as Google and Yahoo, which identify female entrepreneurs (Mcclelland, Swail, Bell, & Ibbotson, 2005).

A total of 188 emails were sent out to potential participants identified through various women groups and 17 direct requests were made on LinkedIn with participants that presented their profiles. The response rate from the emailed requests was very low, at 2% at the end of the data-collection period, which ran between 12 December 2020 and 15 March 2021.

The poor response from the email could have been affected by the current Covid-19 pandemic and the fact that the data collection took place over the December period, when unsolicited and unrecognised emails are pushed to the junk mail folder. In addition, given the challenge of personal email management,

many recipients choose to ignore certain messages, or do not read them all fully (Mcclelland, Swail, Bell, & Ibbotson, 2005)

Most responses were obtained from social media networks through snowball sampling. In snowball sampling, the researcher begins by identifying a few respondents that match the criteria for inclusion through, for example, LinkedIn contacts and requesting them to recommend other participants or forward the survey (Bhattacherjee, 2012).

A total of 48 responses were received. Of these, eight returned an empty survey, with respondents just reviewing the questions without filling in any data. Some 14% of the respondents were either located outside Gauteng or not women and had to be excluded. The analysis and coding took place on the remaining 69% or 33 responses.

Table 5: Study sample

3.4.3 Sampling method

Once the respondents had been identified, non-probability purposive sampling was then used to ensure that there would be sufficient information available on each respondent filling in the survey, and that the data collected would be valuable (Mcclelland et al., 2005).

The non-probability purposive sampling strategy was used to focus on women digital entrepreneurs in Gauteng using Qualtrics software to collect and store

Respondents	Frequency	Percentage	Data
Women Entrepreneurs in Gauteng Province	33	69%	Valid
Women Entrepreneurs outside Gauteng Province	4	8%	Disqualified
Non-women Entrepreneurs	3	6%	Disqualified
Incomplete	8	17%	Missing Data
Total Respondents	48	100%	

the data. In purposive sampling individuals are selected for study because they can impart knowledge that can inform the research problem and central phenomenon in the study (Lewis, 2015).

The criteria for selection were:

- The respondents should be founders or co-founders of digital businesses.
- The business offering should involve the use of digital channels.
- Services should provide digital solutions or offer digital products.

3.5The research instruments

An online survey questionnaire was used to collect data for the study. The online survey was divided into sections to allow identification of the respondents and collect data in relation to the research objectives. The questions were structured as follows:

- The demographics section focused on obtaining information about the business with semi-structured questions.
- Broad open-ended questions were asked to identify challenges at the macro level of the ecosystem.
- Broad open-ended questions were used to identify challenges, barriers and friction at the micro level of the ecosystem.
- Specific questions were asked to probe topics purported to be digital socio-technical enablers and critical to the participation of women in entrepreneurship.

3.6Procedure for data collection

A survey is a research method with a standardised questionnaire to collect data about individuals and their inclinations, thoughts and behaviours in a systematic manner (Bhattacherjee, 2012). This method was suitable for the study as it

could be used for exploratory research where individual people represent the unit of analysis (Schindler, 2019).

The study used an email survey on respondents identified from the internet. The advantage of an internet survey is that it is the least expensive communication method with the most rapid (simultaneous) data availability.

Data collection followed a cross-sectional survey using Qualtrics software to distribute, collect and summarise data. A computer was used to select participants and reduce coding and processing time.

The survey was piloted on five selected entrepreneurs before being distributed to the larger sample. The piloted survey was used to identify any ambiguity, confusing questions or questions that did not return the relevant data to the study.

3.7Data analysis and interpretation

The software NVivo was used for data analysis and interpretation. This software is known for its ability to analyse qualitative data, to gather all the evidence and subsequently organise and group it into similar themes or ideas (Ibrahim, 2012).

The procedure followed used several steps as outlined below:

- Becoming familiar with the data to understand the narratives from the questionnaires and in this way gain insight into the respondents
- Generating initial notes in a cross-sectional analysis of the data to identify common themes
- Searching for themes and correlating across the survey
- Reviewing potential themes in relation to each research objective

3.8Limitations of the study

The methodology had the following limitations:

- The survey had a low response rate because of the low participation of women in digital entrepreneurship.
- Some of the respondents confused digital entrepreneurship with IT-related entrepreneurship and declined to participate in the study.
- Some respondents lacked a compatible device for the survey, with no smart phone or computer access.
- There was a cybersecurity risk with the survey being on the internet and being answered on different devices from respondents.

3.9Validity and reliability

Reliability is the measure of whether the study result is replicable by other researchers or can be reproduced at a later stage. Validity measures whether the means of measurement are accurate and whether they are measuring what they should measure. For this study, the internal and external validity of the study was measured along with the reliability.

3.9.1 External validity

External validity relates to the degree to which the results of a study can be tested beyond the current sample. Can the study results be repeated with other populations and settings?

The following approach was taken by the researcher to improve the external validity of the survey:

- Sufficient questions were developed to answer the research questions.

- The survey was piloted to identify any ambiguous questions and adapted accordingly.

The survey was put on the internet, with the assumption that the respondents would be familiar with the environment of the survey and would have access to it. The survey was captured on an online database and can be repeated and accessed from different settings and tested on a different sample.

3.9.2 Internal validity

“Internal validity” refers to the repeatability and accuracy of the research instrument that is used, i.e. the instrument’s ability to produce the same results repeatedly (Galawe, 2017).

To achieve internal validity, the survey was self-administered and captured on an online database. The self-capturing of the data eliminates potential errors from transcribing the data.

The online survey could be accessed anytime and anywhere, removing the observer’s capabilities and interpretation. The electronic automatic capturing of data reduced data-handling error, as there was no direct handling of data since all was achieved electronically. The data was collected into an online database as the respondents were completing the survey. It was then exported from Qualtrics to MS Excel (Galawe, 2017).

3.9.3 Reliability

The reliability of a study is shown in the similarities among the answers for individuals remaining constant. Reliability can be determined through highly repeatable data stability. Stable and repeatable data shows high reliability, which means the results are reproducible. An NVivo qualitative data analysis package was used for the first stages of coding for organisation of the data into groups and main themes.

The use of NVivo increased data reliability through its capacity to boost the rigour of the analysis process in the following ways (Dollah, Abduh, & Rosmaladewi, 2017):

- Its ability to carry out swift and accurate searches is valuable when handling large amounts of data, which will improve reliability.
- It uses a search facility to interrogate the data, which eliminates human error.
- Searching electronically provides a comprehensive sense that is not altered by memory of incidents.

3.10 Demographic profile of the respondents

The demographic profile of the respondents is summed up in Table 6.

Table 6: Demographic classification of respondents

DEMOGRAPHIC CLASSIFICATION			
Location	**Gauteng**	**Gauteng & Other**	**Not in Gauteng**
	80%	13%	8%
Entrepreneurship Status	**Entrepreneur**	**Employed**	**Both**
	78%	9%	13%
Ownership	**100% Women owned**	**51% and More**	**Less than 51%**
	54%	28%	18%
Age of Business	**More than 3 years**	**1 to 3 years**	**Less than a year**
	82%	10%	8%
Motivation	**Passion**	**Opportunity**	**Necessity**
	53.85%	28.21%	17.95%

3.11 Ethical considerations

The data was collected ethically by providing respondents with a brief outline of what the project was about and the purpose of the questions. The respondents were notified that their participation was voluntary and assured that their identities and company data would remain confidential. In addition to the assurance of confidentiality, the following considerations were undertaken:

- The privacy settings were adjusted to avoid sharing personal information with respondents and to keep the communication professional.
- Direct mail or direct messaging was used to communicate with potential respondents as opposed to engaging with respondents on public posts.

- The researcher ensured that the data collected was only used for the study.
- No identifying data was collected from the respondents apart from that requested in the survey questionnaire.
- The snowballed survey link obtained through social media platforms was anonymous.

CHAPTER 4. PRESENTATION OF FINDINGS

4.1Introduction

This chapter presents the results from the study, which aimed to explore the participation of women in digital entrepreneurship in Gauteng, South Africa.

The findings are reported according to research questions, which were guided by the theoretical framework and literature review.

The chapter begins by presenting the demographics of the survey respondents. The study sought to establish their business operation location, business ownership (whether purely entrepreneurship or employed) and what motivated them to become entrepreneurs. It also looked at their use of digital channels.

The second section of the chapter presents the themes that emerged from the data analysis using the NVivo software. The results are presented in line with the major themes obtained from the theoretical framework. These are the macro-level themes of regulation and policy, infrastructure, digital ecosystem and digital marketplace, and cybersecurity.

The third section focuses on the micro-level ecosystem identified in the theoretical framework, which is concerned with entrepreneurial activity; challenges, barriers and frictions; and socio-technical economic enablers. Figure 7 below presents the framework of the results in diagram form.

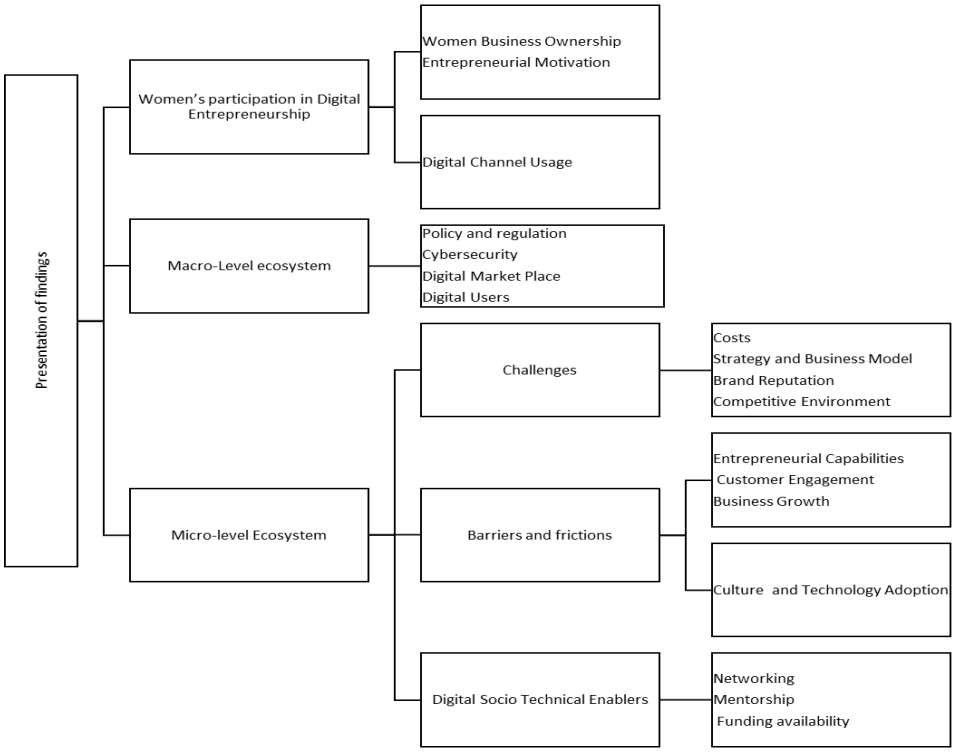

Figure 7: Findings' presentation framework

4.2Women's participation in digital entrepreneurship in Gauteng

Of the survey respondents, 80% were located in Gauteng, with 12.5% operating in Gauteng and other provinces. Some 8% of the respondents did not operate in Gauteng and the data from these respondents was excluded from the analysis.

4.2.1 Business ownership

The sampling and focus were on women digital entrepreneurs in Gauteng. One of the data-collection methods was through identified respondents forwarding the survey to people that they knew. This snowballing method carried the risk of the survey being distributed to individuals outside the targeted population. As a result, 54% of the respondents met the sample criterion of 100% women ownership; 28.2% were businesses that had over 51% of their management or shareholding structure made up of women; and only 18% were not women owned. The number of businesses with a 51% women-owned shareholding structure was lower than the number of women-owned businesses.

4.2.2 Entrepreneurial motivation

The reason behind the entrepreneurial activity of the respondents was established as being one of three factors: passion, necessity and opportunity. The majority of respondents had followed their passion to become entrepreneurs. These respondents had left corporate jobs to pursue their passion through digital entrepreneurship. The rest of the digital entrepreneurs were still employed and had begun entrepreneurial activity in search of additional income.

> *"Seeking a secondary income and my passion for travel." SR46*

> *"Motivation additional income and something that I need to for passion." SR38*

"Desire to help people to shift their mind set to be their best version of themselves. Trusting the soul of what need to be doing. Training as certified coach and is mainly passion pays." SR37

The respondents' inclination to follow their passion meant that they had made a choice to leave their current employment to move into the entrepreneurial space. The motivation was to achieve self-fulfilment and was mostly seen in people-based occupations, such as coaching and travelling.

Digital entrepreneurship in a country with high unemployment becomes a necessity for individuals to sustain their livelihoods and lifestyles.

"I am an entrepreneur by design. A thought leader and a qualified Environmental Health Professional whose currently unemployed for over 3 years now." SR41

"Change, unemployment." SR49

Unemployment is one of the motivations that lead to entrepreneurial activity. This motive is common among graduates that struggle to find employment after completing their tertiary education and are forced to seek alternatives to finance their lifestyles.

Financial gain and the persuasion of opportunities was the. Opportunity entrepreneurship can be motivated by better prospects of financial gain through entrepreneurship.

"I was motivated by financial situation more than anything else, knowing that with hard work and sacrifices I would be one day be liberated and able to purse even bigger opportunities." SR44

"The need for transportation from the old school of doing business to the new and innovative business environment." SR48

4.3Macro-level ecosystem themes

Macro-level ecosystem themes concern the factors that are related to the setting in which a business operates and are specific to an entrepreneurial ecosystem. The macro-level ecosystem affects the way the business is conducted, including the availability of and access to infrastructure, and the presence of the market and customers that the digital entrepreneur requires to succeed.

4.3.1 Policy and regulation

Policy and regulation are the cornerstone of the entrepreneurial ecosystem. Policy and regulation provide an ecosystem environment that either enables or hinders entrepreneurial activity. A question was posed to the respondents enquiring about their aspiration regarding the digital policy in South Africa. Some of the respondents indicated that they had limited knowledge about the digital policies available in the country.

> *"I actually never thought about it to be sincere. But policies that are there to ensure compliance and client protection." SR3*

> *"In the digital policy i m not clued up as much a s i should." SR37*

A digital entrepreneurial enterprise is a business that is operating in a country with different laws, policies and regulations beyond the usage of digital channels. The labour law and its regulations were one of the challenges identified with regard to policy in general and its impact on the running or success of the entrepreneurial activity.

> *"Policy in digital I am not sure, but the policies in SA even if they want to improve looking at the labour law, it protects an employee on things such as minimum wage, it does make economic sense but hinders entrepreneurship from the economic point of views." SR38*

The respondents did not, however, highlight any challenges with regard to policy that were hindering their entrepreneurial activity in the digital space. There was no mention of any regulation that was currently affecting any of the entrepreneurial pursuits by any of the respondents. The general view was that the policy regarding cybersecurity incidents and protection of local businesses from the infiltration of foreign companies could be tightened.

4.3.2 Cybersecurity

In relation to policy and regulation, the respondents explained that digital channels are affected by cybersecurity challenges. They aspired to have a policy with more stringent measures to deter the criminal activity that affects the running of a business on digital channels.

> *"Enhanced security features, there is too many hacking that happen on pages with big followers." SR16*

Theft of identity and data when operating online was identified as a risk factor for women, who could be targeted for criminal activities when their data was exposed online.

> *"Protection for women especially as we are super vulnerable and exposed. Protection for our data and personal information." SR20*

The respondents were also concerned about the regulation of data prices and network connectivity to allow entrepreneurs to run their businesses by leveraging digital channels. The cost of data and internet access is critical to digital entrepreneurship. The business value chain depends on access to the digital marketplace and digital channels. The respondents' aspiration regarding digital policy echoes this fact.

> *"Internet should be made easily accessible and cheaper." SR28*

> *"To have access to affordable data and better connectivity's." SR11*

The control of companies and content creation by international companies need to be restricted to protect local companies.

> *"That it restricts western companies to allow local digital companies to thrive and build their own platforms and apps eg like how China blocks Google." SR2*

The presence of policy and regulation without proper controls and implementation can lead to the policy being ineffective or creating a challenge in the digital space, where it may make the product life cycle longer to prove the product's worth or bring the product to market. The perception of policy ineffectiveness was highlighted by the presence of policy that is available but has other factors contributing to its ineffectiveness.

> *"Policies are out there, yes, but the actual implementation of them is bit tricky and the thing is, if you're trying to prove a concept, doesn't matter what policies or rules are out there." SR36*

The compliance with policies is not limited to country regulation. The usage of digital devices and digital solutions requires contractual compliance with service providers, which adds to the cost of operating the digital channels.

> *"They always need to be updated and renew the licence." SR31*

For the respondents, current policies should be focusing on and implementing solutions to issues rather than creating an environment that is not conducive to operating in the digital space.

4.3.3 Digital marketplace

The respondents indicated the presence of a digital marketplace by referring to teaching platforms where digital content can be placed to be accessed by users at cost. Customers were matched to the services provided by the respondents through platforms such as "dial a contractor" and lead-generation platforms.

“Digital channels are nicer you are at a certain place but able to record content put it up on one of the teaching platform. Drive traffic to them through advertising.” SR38

“Online lead generation.” SR28

Teaching platforms, online lead generation and other matchmaking mechanisms were mentioned by the respondents, including the opportunities presented by digital channels to enable growth in terms of followers on digital platforms.

4.3.4 Infrastructure

Digital infrastructure consists of the services that allow internet connection networks that form the internet, wireless services such as communication satellites and Wi-Fi networks. Gauteng is mainly made up of urban areas or metros; however, the province still has areas that have low network coverage, which leads to poor signal quality. This poses a challenge.

“Doing business in remote and previously disadvantage areas where access to technical information is a scarce commodity and where signal is either very poor or unavailable.” SR48

Infrastructure availability and access are pivotal to operating a digital business. The respondents did not highlight any infrastructural issues, with the exception of Respondent SR48, who referred to infrastructural challenges in areas that were previously disadvantaged.

4.3.5 Digital Business Platform

Digital entrepreneurship depends on the availability and presence of digital users, who are the customers that interact with the business at various points of its value chain. The respondents highlighted the availability and growth of their customer base through the use of digital channels.

“Digital is where the world is going, everybody even retired individuals have to adjust into the digital space, all sectors are moving into digital, the digital has removed the geographical constrains it opens u more market even in the niche market.” *SR38*

“Localization independent you can grow your business from anywhere, it helps get visibility from anywhere in the world, it helps grow your business exponentially well.” SR4

“They are the best platforms to use, we started with zero followers and just by ads on social media we have over 2000 followers.” SR16

There was a confirmation of digital user citizenship and an acknowledgement of the move from traditional ways of doing business to operating in the digital space by the respondents.

The respondents used digital channels as a business-offering mode and for customer engagement, recognising the opportunities brought about by digital channels in their ability to expand their customer bases beyond the normal physical boundaries and scale their businesses.

Social media platforms were the main mechanism used to build a customer base, through social network platforms such as Facebook and Instagram. Word of mouth and telemarketing were still used as part of customer-base building and in some instances a mixture of marketing tools was used.

“Digital channels are nicer you are at a certain place but able to record content put it up on one of the teaching platform Drive traffic to their through advertising through sharing in your own personal page and whoever has a need for that will sign up for the call.” SR37

“Via Facebook and Instagram organic and paid advertising.” SR3

The benefits of social media usage and its power of marketing and customer reach was recognised by the respondents. This is illustrated by the possibilities

such as recording content and uploading it to platforms, which can lead to passive income.

Word of mouth and referrals were also used to build a customer base and create a form of networking, as suggested by the entrepreneurs.

“Word of mouth and using the internet.” SR8

“I do marketing online.” SR2

The use of different marketing mixes by digital entrepreneurship was shown in the use of other marketing vehicles such as showgrounds and exhibitions. Digital entrepreneurship is still entrenched in entrepreneurial traditions and activities. This meant that other networking and customer-base creation methods were still employed alongside digital marketing and channels.

“Through social network and show grounds as well as exhibitions provided by the department.” SR48

4.4Micro-level ecosystem:

Micro-level ecosystem is looking at the entrepreneurial level activities. The ecosystem is more focused on the challenges that women may encounter when using digital technologies within the value chain creation. The barriers that will prevent them from capitalising on the opportunities offered by digital technologies and lastly look at the digital socio technical enablers that are in place to mitigate the challenges, barriers and frictions that they encounter in the value chain creation.

4.4.1 challenges

The micro-level ecosystem challenges are the challenges that are specific to the entrepreneurial activity and affect the day-to-day running of the business.

4.4.2 Costs

The data costs to be online and pursue opportunities were one of the major challenges identified by the respondents. The cost of digital marketing and digital ads was a cost variable that arose from the responses.

> *"Data used is quite a lot and you constantly need to be online you monitor responses." SR11*

> *"Running out of data to access the internet for opportunities has affected me." SR34*

A lack of knowledge on the cost of operating a digital business, including the infrastructure required and resource costing, seemed to be a challenge often encountered at the start-up phase of entrepreneurial activity.

> *"That back office part of being an online business is what i found to be a bit of a struggle and how much money do i set aside to do that. Not understanding how much money i put aside to do it." SR37*

4.4.3 Strategy and business model design

Strategy is a critical factor in any entrepreneurial activity. The identification of which vehicles to use in the digital value chain will lead to proper resourcing and value chain identification and creation. In contrast, a lack of information could result in the business not reaching its target market and not succeeding.

> *"Challenges using social media: 1) not knowing the right strategies to use, 2) not knowing the correct channels to use 3) having the shiny object syndrome going after every single new strategy that looked profitable." SR19*

> *"The challenge of being focused on your target market is the main thing that is difficult there is so much out there and you can suffer from FOMO. The basic business principle hasn't changed. You just want to reach out*

and you just wasting time as far as I see it hasn't changed its just accelerating." SR40

The respondents reported that the opportunities presented by digital channels could be overwhelming. For them, focus and strategy were important to avoid the temptation of trying to embrace all the opportunities rather than focusing on the value proposition that would be best for customers.

4.4.4 Brand reputation

Brand reputation is threatened by the ubiquitous presence of cyber threats on digital platforms, and this provides a barrier to online business.

"Building trust with the audience. There are many scams going around." SR6

Cybersecurity risk affected both the women digital entrepreneurs and their customers. The digital environment can mask the real identity of individuals that entrepreneurs engage with, thus exposing both the entrepreneur and the customer to cybersecurity risk.

"The challenges is that I got most of scams pretending to give business." SR8

"Clients don't trust it enough." SR9

"You cannot differentiate really between scammers and serious potential clients. The risk is huge as you never really know who you are doing business with." SR20

The respondents verified cybersecurity risk as one of the major challenges that affect digital entrepreneurship in general and brand reputation in particular. The large number of scams lead to a lack of trust by both entrepreneurs, who are at risk of providing services to scammers, and digital users, who become wary of doing business with entrepreneurs as they fear being scammed.

4.4.5 Competitive environment

The low barriers to entry, reduced operational cost and ease of scaling make the digital entrepreneurial ecosystem a very competitive environment.

> *"It's not easy to get customers through channels because everyone is using it." SR15*
>
> *"To get clients it is not easy." SR23*
>
> *"For me the challenge has been transforming leads into warm leads to hot leads." SR39*
>
> *"The cost of the platforms, no analysis on the target market, biased in ranking or exposure, group think mentality, restricted." SR19*

The competitiveness of the ecosystem is corroborated by the respondents' difficulty in transforming warm leads to hot leads and in acquiring customers, which they reported could take longer than anticipated owing to supplier saturation.

4.5Micro-level ecosystem: barriers and frictions

Digital channels remove the traditional operating hours of brick-and-mortar businesses and digital operations are run on a continual basis. The constant engagement online can lead to the entrepreneur being immersed in customer engagement and management. A constant online presence also requires data. These are among the barriers and frictions encountered in the micro-level ecosystem and are described below with other challenges identified by the respondents.

4.5.1 Entrepreneurial capabilities

To run a business in any context requires a certain level of knowledge. Digital entrepreneurship is one of the fields that require a dual-mastery skill set that

includes both managerial and technical skills. Attaining these skills can present a barrier to becoming involved in digital entrepreneurship.

The respondents mentioned a range of skills that they deemed critical to digital entrepreneurship. Digitally based skills, such as data analytics and digital marketing, were reported to be critical.

> *"Basic website management, content development, capturing testimonials and customer feedback." SR4*

> "*Knowledge about internet marketing." SR8*

> *"Technical and Soft skills are all needed like Data Analytics, Innovation, problem solving, digital marketing etc." SR2*

> *"Government should have more programs that teach entrepreneurs to be tech saavy." SR28*

Personal skills and soft skills were also cited as critical for running a business in the digital space, alongside professional conduct and a good work ethic dispensation.

> *"Good communication skills, good marketing skills, sound work ethic." SR49*

> *"Not skill as such, but a talented eye and a creative nature coupled with a desire to learn." SR41*

> *"Ability to apply all that in a corporate manner to reach and achieve successful deployment and accountability." SR41*

As trust and cybersecurity present a friction when operating in the digital space, ethical behaviour was pointed to as critical to the digital entrepreneur.

> *"What's most important to me is ethics... not sure if you would regard it as a skill but the values and principles that people do business with is what's most crucial to me. I don't want to be associated with people who*

cut corners to get what they want and I don't want to ever be asked for favours in return." SR47

The array of entrepreneurial skills that are crucial in the digital space is vast and diverse. The respondents' statements demonstrate the challenge that, for the entrepreneur, running a small or owned business without proper support and the ability to acquire the necessary skills can be a cumbersome task.

Skill becomes a critical resource for business success, with the respondents writing that entrepreneurs have to be able to identify the resources that are critical to the specific business. The technical skills might have to be outsourced to allow the entrepreneur to focus on the strategy and managerial functions of the business.

4.5.2 Customer engagement

Digital entrepreneurship creates an interactive business environment with constant engagement with customers, according to the survey respondents. The increased attention required from women digital entrepreneurs can be overwhelming. The constant online connection leads to high data usage and adds to the subsequent cost of operating the business.

"My experience has been overwhelming. It requires constant presence on social media and what you do while their matters." SR39

"Data used is quite a lot and you constantly need to be online you monitor responses." SR11

The digital entrepreneurship environment, according to the respondents, is competitive owing to the low barriers to entry, which lead to increased digital entrepreneurship participation. The competitive environment, coupled with a possible biased ranking on the websites, adds to the ecosystem resource competition. The use of terms such as "overwhelming" and "constant engagement" by the respondents shows the level to which digital

entrepreneurship emphasises customer-base maintenance. This creates a friction for digital entrepreneurs operating in this ecosystem.

4.5.3 Business growth

A positive characteristic of digital entrepreneurship is its ability to scale at a rapid rate through the use of digital channels. The removal of barriers allows for a reach of customers that would have been difficult to attain through traditional methods. This scaling was alluded to in the respondents' mentioning of customer reach as one of the benefits of digital.

> *"Localization independent, you can grow your business from anywhere, it helps get visibility from anywhere in the world, it helps grow your business exponentially well." SR3*

> *"You get to reach a lot more people who are your target market. It's easier to build a brand and be easily recognised. It's easier to get referrals." SR28*

The statements above show the ability of companies to scale by leveraging digital channels as part of their business value chain. While this is useful, the ability of the entrepreneur to respond appropriately to rapid scaling of the business and seize the opportunities it presents can be a barrier. For the entrepreneur to respond to the rapid scaling and maintain customer satisfaction could require the expansion of the business in terms of resource and customer management.

4.5.4 Culture and technology adoption

The adoption of new technology is considered a driving force for economic growth and sustainable development (Eseonu & Egbue, 2014). Despite this, the adoption of technology and the transformation of business transactions by clients were difficulties faced by entrepreneurs. The transformation from the

traditional operation to the digital space was one of the barriers cited by respondents.

> *“There is an also a culture to adopt technology to do things because people are still used to doing things their own way.” SR36*

> “*Companies or potential clients still hold on to traditional ways of procuring sales and holding customers far off.*” *SR41*

Despite the benefits and the ease of doing business that digital channels offer, digital offerings and the transformed way of doing business have not yet been adopted in some circles. The respondents indicated that there is reluctance of technology adoption to a certain extent and is an important factor for the success of the digital enterprises.

4.6Micro-level ecosystem: digital socio-technical enablers

The digital socio-technical enablers are factors such as the availability of professional communities for knowledge transfer. This could be in a form of mentors or part of a network. Such communities can offer a vast pool of expertise and insights and provide feedback or ideas for product development and testing (Wagner, Liu, Schneider, Prasarnphanich, & Chen, 2009). A third enabler is the availability of funding for the entrepreneur. All of these factors are discussed below.

4.6.1 Networking

The availability of networks in the ecosystem is deemed to be an enabler of digital entrepreneurship. The networks used by the respondents were digital channels or social media platforms, digital advertising and word of mouth, with corporate networks and family and friends being the least-mentioned way of building a customer base.

“Network is a way to go in this new dispensation, especially because of the invention of the 4th industrial revolution where technology is playing a pivotal role in our lifetimes. long physical presentations, instead they prefer to use information at their own comfort and in their own ways and space.” SR41

“Through network both on and of social media platforms.” SR20

“Marketing and word of mouth.” SR13

“Leverage of existing networks formed during employment.” SR2

“The 1st place I looked was my network. Network people from church before family friends. You know people that you've already done business with. They know you. It's much easier to go to those people because they know you.” SR40

4.6.2 Mentorship

The respondents’ view on mentorship was generally positive, with mentorship being identified as critical for growth and networking opportunities by some respondents. Learning from experienced individuals and knowledge transfer were two of the factors mentioned.

“Mentorship is very important for any emerging entrepreneur who is serious about growing their business and turnover. You get to tap into what the tried and testing have done to be successful, you get to be challenge and reminded of very important principles of be being successful. It can even get to a point wherein you get to be introduced to more influence decision makers and access to greater markets.” SR41

“Mentorship is about capacity building and restoration and sharing of good practices. It prevails guidance and support to mentees by experience mentors.” SR48

“I think mentorship is very important to assist us and motivate us in trying times so that we don't give up.” SR8

Some respondents saw less value in mentorship, believing it to be a subjective experience that worked for some individuals only.

“I think it doesn’t work for everyone. There are many factors that need to be taken into consideration when mentoring. I think it’s a subjective thing and subject to how much the mentor is willing to do and how far the mentoree is willing to go.” SR19

Some respondents took a negative view of mentorship: the identification or acquiring of a mentor was reported as a challenge, the value it added to the entrepreneur considered minimal and its lack of providing business success in terms of finding customers noted.

“It is hard to get and sometimes if you do get it its totally ineffective and a waste of time as trainers are not that well trained.” SR28

“I attended Raizcorp and Bophelong mentorship program it's not helping in terms of getting us business.” SR15

The respondents illustrated that mentorship as part of the socio-technical enablers served as a mitigating factor for barriers to entrepreneurial successes. Mentors were considered able to provide the guidance required in building a strategy and expanding one’s network.

While it was generally acknowledged that learning from a mentor can assist with useful entrepreneurial traits and skills to assist the mentee to learn business skills and create value, respondents suggested that it needed to be available and beneficial to the entrepreneur to achieve its purpose.

“It lacks in South Africa and very limited to business will succeed based on who you know not what you offer.” SR2”

The suggestion that mentorship is lacking in South Africa highlights the possibility of a lack of relevant mentors for women digital entrepreneurs. The acknowledgement of the contribution of mentorship to business success was a common theme across respondents, including those with a slightly negative view of mentorship.

4.6.3 Access to funding

Funding availability and access at the nascent stages of developing a digital business are critical for the survival of the business. The acquisition of resources and value creation could be dependent on the availability of funds. For digital entrepreneurship, this could range from funds for data to operate online, to funding for marketing or setting up the systems required for a digital business.

> *"If you want to easily get access to the funding, so proving the concept is what is the challenging part because you've got this great idea, you have to take it to market after taking to market quickly.*" *SR40*

> *"The finance to fund the marketing channels." SR7*

To have a business ready to operate in the digital space requires resources to create content and systems that will allow the business to operate on digital platforms. The challenge concerns the time required to set up a structure that is market ready to take to the investors to access finance. Meeting operational costs, such as the digital marketing cost, was also cited by the respondents as a challenge. Access to funding is an enabler to entrepreneurial activities; however, acquiring the funding was reported to be challenging.

4.7 Summary of findings

The participation of women in digital entrepreneurship depends on the ecosystem in which the digital entrepreneurship is carried out. At the macro level of the ecosystem, the current policy and regulation do not hinder any

business operations in the digital space. There are regulations and rules in place, however, that are not easily or consistently implemented when business contracts are negotiated.

The aspiration from respondents was that policy and regulation be developed to curb the cost of data and doing business online, add more controls with regard to cybersecurity, activate increased data-privacy measures and monitor the local company competitive landscape.

The digital marketplace and digital users allow business transactions in the digital space. Infrastructure is not a particular challenge to business transactions, with the exception of areas that still have low data coverage.

In micro-level system, the challenges identified by the respondents mostly concerned the high cost of data, which was brought about by the need for constant customer engagement. The ability to create a strategy and focus to avoid pursuing all possible opportunities without any focus was one of the main challenges identified. Cybersecurity is synonymous with an online environment and surfaced across all the themes as a challenge that affects the running of the business, trust and the business brand.

Socio-technical factors were considered critical for overcoming the barriers and frictions that digital entrepreneurs encounter. Mentorship was recognised as able to assist with the skills and experience of the business and the required skills that can only be acquired through tacit learning. Networks were also considered critical in terms of branding, customer acquisition and referrals. Useful entrepreneurial skills for the digital entrepreneur should be the ability to identify the particular skills required by the company and acquire the necessary resources.

Culture and technology adoption was a theme revealed by the data as important. A culture that is digitally transformed will lead to more users and the expansion of the online market.

Funding was not mentioned as a challenge by all the respondents. The challenge associated with the acquisition of funding for innovations was the life cycle length needed to prove a concept in the digital space (from inception to a bankable concept), which was necessary to be able to access the available funds.

CHAPTER 5. DISCUSSION OF FINDINGS

5.1 Introduction

This chapter presents the research findings according to the theoretical framework and literature review. Each category is discussed in relation to the actual quotations from the sample of respondents. The findings are then compared and contrasted with other studies discussed in the literature review.

5.2 Women's participation in digital entrepreneurship

There has been an increase in individual and collective entrepreneurial activity among women. The growing entrepreneurial activity may be a key to advancing slowing global economies (Xuan Luan & Thanh Tung, 2019).

5.2.1 Business ownership

"There is growing participation of previously disadvantaged individuals, and more businesses target disadvantaged communities, with positive social impact" (Climate Transparency Report, 2020, p.45).

Women in Gauteng participate in digital entrepreneurship; the majority of the women respondents ran 100% women-owned companies or had 51% or more ownership of the businesses.

Digital entrepreneurship arises when a resource owned by a business, a service is carried out by a business is digital (Antonizzi & Smuts, 2020; Bogdanowicz, 2015; Recker & von Briel, 2020).

5.2.2 Digital channel usage

Broadband access and the use of digital channels have been shown to bring significant opportunities to digital entrepreneurs, such as enabling them to reach new target customers (Karjaluoto & Taiminen, 2015). Digital marketing, particularly on social media, provides opportunities for micro enterprises to appeal to new customers and retain existing customers more efficiently, with digital channels become critical factor of an organisation's marketing communications and branding.

The study findings agree with the literature that digital technology has brought about new opportunities, with companies relying on digital channels as part of their business operations (Elia et al., 2020).

Digital entrepreneurship involves entrepreneurial pursuits on a digital platform that rely on digital media tools and IT.

The women entrepreneurs focused on in the study used digital channels, with social media cited as one of the primary mechanisms used for customer engagement, digital advertising and marketing. The businesses leveraged digital channels on the services, thus providing an added benefit to their businesses.

5.2.3 Entrepreneurial motivation

According to Botha et al. (2007), women in South Africa choose to pursue entrepreneurship owing to a lack of employment. The study findings show a contrasting view, with most of the respondents in digital entrepreneurship to pursue their passion. This fact is further illuminated by the respondents having left corporate opportunities to pursue entrepreneurship.

Botha et al. (2007) also find that, in addition to economic motives, women pursue entrepreneurship with an interest in their clients (being more client-focused than men), in ethical operations and in making a social contribution.

5.3 Macro-level ecosystem themes

The macro-level ecosystem themes are the themes that affect the running of a business in any country, and relate to issues such as policy, availability of consumers and the market. In terms of digital entrepreneurship, the most relevant themes are policy and regulation, the digital marketplace, infrastructure and the digital user citizenship.

5.3.1 Policy and regulation

Policy is the cornerstone of most of the enablers of the entrepreneurship environment and a critical factor in the promotion of any entrepreneurial activities in a country. The institutional framework set by public policy affects the prevalence and performance of entrepreneurship in that country (Henrekson & Stenkula, 2010).

The study finding indicated no policy or regulatory challenges that impeded or hindered the women's participation in digital entrepreneurship. The women expressed the hope that current policies would improve to further encourage entrepreneurial activity in the digital space. The greatest emphasis was placed on the control of cost for data and the curbing of cyber-related risks.

Cybersecurity was one factor that was highlighted across the respondents as a constant worry in the use of digital channels. Cyber risk was high during the creation of payment gates, and fraudsters were a threat in digital transactions.

According to the South African profile in the Climate Transparency Report of 2020:

> "Both national and provincial governments are playing a strong role in the development of digital entrepreneurship in South Africa; but current policies fail to reflect changing global operating conditions in the industry, while policy action suffers from lack of coordination and insufficient monitoring." (Climate Transparency Report, 2020 p.40)

The cost of access devices and equipment is also affected by the implementation of duties and taxes; it is in this area that the policy framework can be structured in such a way that it is still profitable for start-up businesses so that participation in the digital economy is promoted (Holmes, 2014; Ndonga, 2020). The digital marketplace is an online platform where customers and entrepreneurs meet to share information on their value proposition, and to negotiate and transact. In using a digital marketplace, organisations may face additional capital for emerging technology and digital systems needed to connect to the digital marketplace (Pucihar & Podlogar, 2005).

Training and education need to be provided for users, and system reconfiguration needs to be undertaken. Entrepreneurs should be aware of possible extra operating costs and the potential requirement for extra investments (Pucihar & Podlogar, 2005).

The need for investment in the back office and integrated systems in the start-up phase and further investment in the form of digital marketing and costs related to customer engagement was confirmed by the participants of the study (Bakos, 1997; Pucihar & Podlogar, 2005).

5.3.2 Infrastructure

“Infrastructure” in the digital ecosystem refers to network quality, accessibility and signal coverage, connectivity and digital devices. According to Venter et al. (2019), In 2017 “Gauteng province had the highest prevalence of internet access with 74% of households, followed by the Western Cape with 70.8% and Limpopo had the least at 43.6% of households” (Venter et al., 2019. p.22). The respondents’ answers pointed to the need for policy and investment to develop infrastructure to improve network coverage and affordability for most of the population. This investment will increase information access, networking opportunities and resources, which will promote the digital entrepreneurship participation of women.

According to IDTT (2020) internet and telephonic access costs are relatively high in South Africa. However, for the country to benefit from the digital economy, it will need to improve access to digital networks and internet services in terms of rates, variety and quality of access. There is a call to focus on safeguarding consumer's interest for those citizens that can participate.

5.3.3 Digital user citizenship

The study demonstrated that the major benefits of digital channels are the access they provide to customers and marketing, as digital channels are a powerful marketing tool. The respondents announced their presence to user communities on digital platforms and used digital advertising and marketing tools to increase their customer base through digital marketing.

The success of the digital economy depends on the presence of large number of buyers and sellers with knowledge and full access. According to the digital report in January 2019, there were 31.18 million internet users, 23 million active social media users and 22 million mobile social users in South Africa (Hootsuite, 2019).

5.4 Micro-level ecosystem themes

Using Sahut et al.'s (2019) Digital Ecosystem Conceptual Framework, the micro-level ecosystem themes were divided into challenges, barriers and frictions, and digital social technical enablers. Challenges can be classified according to the stage in the value-creation process, which is divided into the information generation or acquisition, processing, distribution sharing and consumption stages (Sahut et al., 2019). (See Figure 5 in Chapter 2.) The literature reviewed identified a number of challenges that prevent women from participating in digital entrepreneurship. These include having to cope with an excessive amount of data that cannot be processed, the lack of business knowledge and digital skills, disproportionate competition and competitor-saturated markets, and the inability to attain capital. The exorbitant costs

associated with starting up a digital business and the inability to keep up with disruption factors and costs are two further challenges that women encounter (Antonizzi & Smuts, 2020). The challenges identified in the study are outlined below.

5.4.1 Cost

The respondents cited cost of data as the highest challenge they experienced. This agrees with views found in the literature that the cost of data in South Africa is exceptionally high (Chinembiri, 2020; Van Belle, 2011). Most South Africans cannot afford to go online because of data costs and the inability to afford internet-enabled devices (Bakos, 1997; Chinembiri, 2020; Gillwald, Mothobi, & Rademan, 2018; Venter et al., 2019).

5.4.2 Strategy and business model design

Strategy is about engaging in opportunity-seeking and competitive advantage-seeking behaviours to create wealth. The disruptive nature of digital technologies necessitates that an entrepreneur develop strategic agility and adaptability in a highly dynamic environment (Djordjevic, 2013).

Standing and Mattsson (2016, p.1) define a business model as “a system of interconnected activities that determine how companies do business with its customers, partners and vendors”.

The business model method originates in strategy; it is applicable to digital entrepreneurship since a new venture expects to create digital value. Although it is possible to draw a business canvas for any company, the digital channels give various options in which value can be created (Sahut et al., 2019).

The study found that a lack of understanding of the business model or clear strategy had the potential to derail the entrepreneur’s focus. The availability of many options without proper strategy alignment could result in a split focus that

will be detrimental to the business. The fear of missing out on all possible opportunities was a challenge that the study respondents identified.

5.4.3 Cybersecurity and branding

Digital technologies eliminate regional borders and form a globally linked environment. The seamless character of the internet makes the top cybersecurity threats global in nature rather than being limited to South Africa (Albahar, 2019).

The study found that cyber criminals pose a significant risk to the digital entrepreneur. The prevalence of cyber-criminal activities affects brand trust and limits business transaction opportunities. Entrepreneurs are exposed to potential scammers in providing their business whilst customers have to trust the legitimacy of the company to transact with it.

The findings are in agreement with the literature, which suggests that business is transforming itself by adopting leading technologies and innovative data-driven business models to counter the cybersecurity risks as a vital element of every business's success (Acs et al., 2017; Bissell, Lasalle, & Cin, 2020; Gillwald et al., 2018). There has been a noticeable increase in cyber-attacks. The period between 15 March and 21 March in 2020 saw a spike in network attacks, which rose from 20,000 to 30,000 in South Africa(Prior, 2020). South Africa is prone to cyber-attacks owing to its market maturity, with international firms having offices in the country. However, its technology and cyber skills are still lagging behind the rest of the world (Ndonga, 2020).

South Africa needs to introduce an adequate data-governance system that facilitates interoperability and flexibility (and thus competition and collaboration), while protecting the privacy of consumers and citizens (IDTT, 2020).

5.4.4 Competitive environment

The respondents revealed that it can take a long time to find leads or convert warm leads to hot leads through the chosen digital-marketing channels. Bias and uneven exposure can lead to challenges in the acquisition of clientele. Literature attests that the pace at which technology changes on digital platforms is rapid and the intensity of competition is very high (Norton Rose Group, 2016). While network effects and installed base advantages are critical determinants of success in platform industries, these settings are also characterised by technological innovations that often lead to the introduction of new platforms and new competitors (Srinivasan & Venkatraman, 2018). This makes the ability to differentiate one's offerings and adapt rapidly to technological change critical for success and survival (Srinivasan & Venkatraman, 2018).

5.5 Micro-level ecosystem barriers and frictions

In the context of this study, barriers are obstacles that prevent movement or access or are hurdles that hinder women entrepreneurs in the running of their business. Barriers require great use of mental strength to overcome (Chinomona & Maziriri, 2015). Frictions are factors that present resistance in the running of the business or result in business-process inefficiencies (Sahut et al., 2019).

5.5.1 Entrepreneurial skills

Entrepreneurship is central to any business start-up and entrepreneurs have certain characteristics in common, such as determination and tolerance of risk (Standing & Mattsson, 2016). A lack of entrepreneurial know-how about running a business, opportunity identification and risk-taking were highlighted by the study respondents as issues that could impede the success of a venture.

The entrepreneur needs an understanding of how general business processes work, the capacity to create digital business content and the ability to manage

the business. Park (2005) suggests that the majority of entrepreneurs have previous work experience and social capital networks that they apply and capitalise on. Of the survey respondents, 21% explained that they used previously established corporate networks to find customers.

Digital entrepreneurship-based businesses require both digital and traditional business knowledge. This translates into the need for entrepreneurs to acquire both technical and business skills, which is a dual-mastery skill set and therefore not easily gained (Antonizzi & Smuts, 2020).

In agreement with the literature reviewed, the skills that were mentioned by the respondents ranged from soft skills to technical and managerial skills.

Digital entrepreneurs synergistically combine business, institutional and knowledge entrepreneurship to be able to take traditional practices and alter them digitally (Antonizzi & Smuts, 2020).

5.5.2 Customer engagement

The study findings demonstrated a need for constant involvement with the customer through digital channels. The respondents felt that the success of a digital business depends on the digital entrepreneur maintaining customer loyalty and networks. They expressed that engagement could be a challenge in terms of the cost of the platforms and that customer engagement could be a barrier when it overwhelmed the entrepreneur.

Customers' daily lives have become infiltrated by social media. Customers' business interactions are affected and reshaped by social media engagements, given the prevalence of social media as enabled by digital technologies (Brodie, Hollebeek, Jurić, & Ilić, 2011; Wang & Lee, 2020).

The study findings agree with literature that highlights the importance of constant engagement with the customer. Customer engagement is a significant share of the survey through feedback given by customers regarding transaction

quality. It can involve online reviews but can also include data on user engagement and customer service complaints (Fradkin, 2020).

5.5.3 Business growth

The digital channels provided growth to the entrepreneurs' businesses by removing physical barriers, which allowed networking and customer reach in areas that would not have been possible before. This agrees with the view expressed by Sahut et al. (2019). This growth can be explained through the scaling effects of social interactions that can be exploited because they are digitally enabled and supported (Recker & von Briel, 2020; Srinivasan & Venkatraman, 2018).

5.5.4 Culture and technology adoption

The study found that there was a level of resistance to digital transformation and adoption of technologies in society, with the respondents finding that clients often chose to stick to traditional business interaction. This finding was confirmed by literature, which suggested that the rate of technology adoption varies, depending on technology type, social openness, regulation and a number of other social factors (Antonizzi & Smuts, 2020; Eseonu & Egbue, 2014; Venter et al., 2019).

5.6 Micro-level ecosystem digital socio-technical enablers

Micro-level ecosystem digital socio-technical enablers are factors that are available in the ecosystem that can be used by entrepreneurs to address the challenges and friction in each phase (Sahut et al., 2019).

5.6.1 Networking

The size of the entrepreneur's network is important. Larger networks will offer greater benefits and support, which could result in entrepreneurial success, compared to the entrepreneur with a smaller network (Smith & Smith, 2019).

Knowledge about women entrepreneurship can be gained through women entrepreneur networks, which are continuously adding value to the development and facilitation of women's entrepreneurial ventures (Carrington, 2004).

Networking was one of the factors cited by the respondents as important for the success of digital businesses, with the prescience of the networks the pathway to relevant information and new opportunities. Corporate networks formed the survey respondents' primary networks through social media and word of mouth, followed by family and friends.

5.6.2 Mentorship

The view on mentorship gained from the findings was that it is important in the expansion of networks, in the acquisition of skills and in obtaining guidance. This is in agreement with the view of Sahut et al. (2019) that mentorship as a digital technical enabler can be used by entrepreneurs to overcome the challenges and frictions in their business processes.

According to Wyrwich, Stuetzer, and Sternberg (2016), observing entrepreneurs in familiar settings affords knowledge transfer from mentor to mentees about tacit entrepreneurial skills and capabilities. Mentees have the opportunity to ask questions related to start-up challenges.

Attributes of a successful DEE are the availability of mentors, high network density, and access to relevant resources, human capital and financial capital. Mentorship was a factor identified as important to the study as an indicator of an ecosystem capable of promoting entrepreneurial activity in digital entrepreneurship (Spigel, 2020).

However, there was acknowledgement that mentorship was sometimes lacking and not always effective. The importance of mentorship for the respondents resonates with the findings of Cross et al. (2019) that although mentoring promotes personal and entrepreneurial development and provides psychosocial support, it is not always easily carried out because of various organisational factors and personal and social dynamics. Enablers of mentoring are the accessibility of a mentor and mentoring skills, nurturing relationships, support and responsiveness (Banerjee-Batist, Reio, & Rocco, 2019).

5.6.3 Funding availability

The South African government offers several loans and incentive programmes for start-up business owners; however, the majority of the incentives are not suitable for digital entrepreneurs (Wikipedia, 2020).

The study found that one of the challenges with accessing funding is the requirement to have a proven concept that can be tested prior to the funding being approved. The literature alluded to the fact that it could take a while to bring a digital value proposition to the stage where it is bankable (Karakaya & Kerin, 2007; Pucihar & Podlogar, 2005).

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents conclusions drawn from the research findings with the aim of achieving the research objectives through answering the research questions.

The aim of this research was to explore the participation of women in digital entrepreneurship in Gauteng Province; analyse macro- and micro-level challenges and micro-level barriers and frictions faced by women entrepreneurs; and identify the socio-technical enablers of digital entrepreneurship that might support the participation of women in a DEE.

6.2 Conclusions in relation to the research questions

The study aimed to answer the following research questions:

1. What are the features of women's participation in digital entrepreneurship in Gauteng Province, South Africa?
2. What macro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?
3. What micro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?
4. What micro-level digital entrepreneurship barriers and frictions affect the participation of women in entrepreneurship in Gauteng Province?
5. What are the socio-technical enablers of digital entrepreneurship that may support the participation of women in the digital entrepreneurship economy of Gauteng Province?

The conclusions reached from the study findings are presented below according to each research question.

6.2.1 Research Question 1

Research Question 1: What are the features of women's participation in digital entrepreneurship in Gauteng Province, South Africa?

Women participate in digital entrepreneurship in Gauteng Province in South Africa. The leveraging of digital channels is seen by women as a part of the business model and as a value proposition. Digital technologies have been found to provide benefits such as scaling, low barriers to entry and the ability to operate beyond traditional borders.

The motivation for the women's participation in digital entrepreneurship is mostly passion, with the women leaving their corporate jobs to pursue work that contributes to their personal values. Passion is followed by self-employment as a driver for entrepreneurial activity.

6.2.2 Research Question 2

Research Question 2: What macro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?

Macro-level ecosystem factors such as policy and regulation are present but do not hinder digital entrepreneurship activity. There is, however, a weakness in the policy and regulation system in that it fails to support micro enterprises, which are the enterprises mostly adopted by women that participate in entrepreneurship. This is highlighted by factors such as the lack of protection from value added tax for enterprises with a turnover of less than a million rand.

Gauteng is one of South Africa's most digitally advanced provinces, with digital infrastructure generally in place across the province. This was evident from the findings that no challenges were experienced by the respondents.

In terms of macro-level entrepreneurship factors and an environment that is conducive for digital business, the entrepreneurial ecosystem offers platforms, users and community presence. Infrastructure in Gauteng does not provide a challenge; however, there is a need for further investment to allow better coverage in all areas and affordable access to promote data acquisition and innovation.

6.2.3 Research Question 3

Research Question 3: What micro-level digital entrepreneurship challenges affect the participation of women in entrepreneurship in Gauteng Province?

The cost of running a business is a critical factor for start-ups to be successful. The current data prices in South Africa are still a major hindrance to women's participation in digital entrepreneurship.

A strategy and proper business model design are important for the success of a digital enterprise and the continuous participation of women in digital entrepreneurship. The knowledge of which platforms to use and the identification of the target market are critical factors for women participating in digital entrepreneurship in Gauteng.

Maintaining customer loyalty through constant engagement and customer reviews is imperative for digital entrepreneurship success. This is because low barriers to digital entrepreneurship translate as more people competing on the same platforms for the same customers in a highly competitive environment. In addition, cybersecurity affects business reputation with the multitude of scams that occur, which means that trust can be easily lost or that both entrepreneurs and customers fall prey to cyber-attacks.

6.2.4 Research Question 4

Research Question 4: What micro-level digital entrepreneurship barriers and frictions affect the participation of women in entrepreneurship in Gauteng Province?

Skills required for digital entrepreneurship should not focus on technology but rather on opportunity identification and value-chain creation. Skills such as coding and computer programming are perceived as important, but not for the entrepreneur, as these skills can be outsourced. Critical for the entrepreneur is their ability to recognise the skills that are important for their business and outsource if necessary.

Ethical practices and principles were revealed by the study findings as important systems for entrepreneurs when operating in a dynamic and cyber-risk prone digital environment. In addition, the adoption of digital technologies and digital transformation are both critical in providing digital offerings. There must also be a change from the traditional way of doing things.

6.2.5 Research Question 5

Research Question 5: What are the socio-technical enablers of digital entrepreneurship that may support the participation of women in the digital entrepreneurship economy of Gauteng Province?

Networking and referrals are a powerful tool that exposes the entrepreneurs to opportunities and enables them to build a brand. These practices can take the form of referrals and appraisals from digital networks.

The availability of mentorships can assist in areas where the entrepreneurs lack the skills required to deal with challenges by allowing them to tap into the knowledge and experience of mentors.

The cost of running a digital business for a start-up venture can be eased with the availability of funding, which could take the form of loans or crowdsourced

funding. The challenge with accessing a funding mechanism is the cycle time it can take to bring a digital service online. This can be mitigated by the availability of government funding geared at micro enterprises.

The payment gate and financial-instruments' system enables a business to run digitally. Skills to create channels and financial gateways and customer-management systems are available and can be outsourced.

6.3 Recommendations

The following recommendations are made on the basis of the conclusions:

- Digital infrastructure cost and access were identified as barriers by the respondents. These can be mitigated by investment in digital infrastructure by the government to increase coverage across all areas of the country and lower the cost of accessing digital devices.

- The government should also develop a policy framework that is conducive for micro enterprises to operate under as this will lead to increased participation of women in digital entrepreneurship.

- The adoption of technology and the general culture can be assisted by a policy focus by government on digital-governance and support programmes that expose consumers to digital opportunities and further provide protection through robust policies on data protection and cybersecurity.

- Barriers associated with brand and network expansion and opportunity identification can be mitigated by the availability of mentors who can guide the mentees into the formulation of strategies and business model designs that are profitable.

6.4 Suggestions for further research

- Digital entrepreneurship is a new concept and to understand its impact on women's participation in entrepreneurship, a cross-sectional study covering the whole of South Africa would provide a broader, more inclusive view of the subject. The study should establish its impact on the provinces that are not as digitally transformed as Gauteng to assess the impact, if any, of the digital divide.

- There is also a need for a database with a gender-specific classification of entrepreneurs to form a baseline of the current participation of women in entrepreneurship and quantify it. It would be useful subsequently to track these entrepreneurs over a period of time to ascertain whether the premise of increased participation through digital channels is correct.

  Adopting a holistic view to the study of this topic will be beneficial toward an understanding of cultural perception and the adoption of technologies that are critical to the success of digital entrepreneurship and possible areas to focus on. The research should take the form of interviews to allow for in-depth data acquisition and deeper understanding of the field.

- Policy and government-support programme analysis could be undertaken to establish its impact and ability to promote and facilitate job creation. A country-comparative study of the success factors towards digital entrepreneurship could also be usefully adopted.

6.5 Conclusion

Digital channels have the potential to increase the participation of women in digital entrepreneurship in Gauteng. The South African entrepreneurial ecosystem is conducive to new entrants to the system in terms of the policies that are currently available and the presence of a digital marketplace that allows digital transactions to take place. The challenges and barriers that are faced by

the women entrepreneurs can be solved by utilising socio-technical enablers such as the mentors and networks that are available.

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APPENDIX A: Data-Collection Instrument

Table 7: Survey questionnaire

High Level Factors	Questions
Demographics	Are you based in Gauteng Province?
	Are you an Employed Or an Entrepreneur
	Name of your company
	Type of Business
	How long have you been in Business?
Entrepreneurial Motivation	What motivated you to start your business
Women Participation	Is the business Women owned?
Networking	How did you develop a customer base?
Digital Channel usage	What has been your experience in using digital channels Whatsup, Website, Facebook, Instagram
	In your view what are the benefits of using digital channels?
Challenges	What are the challenges have you faced with the digital business, using digital channels?
	What skills do you regard most crucial for the business?
Policy and regulation	What are your aspirations for digital policy in SA?
Networking	What is your view on Business Mentorship

APPENDIX B: Survey Participation Request

Dear Participant.

My name is Elsie Phelane.

I am studying for an in Management Digital Business in the School of Business at the University of the Witwatersrand. For my final Master's dissertation, I will investigate Women's participation in Digital Entrepreneurship. Supervised by Dr Manessah Alagbaoso.

The objective is to explore the participation of women in digital entrepreneurship in Gauteng, South Africa.

This study has been approved by the Ethics committee of Wits Business School. As part of your participation in the study, I request you to take part in to fill the questionnaire attached below. Your participation is voluntary, and you are free to withdraw. The information you provide will be kept confidential, and no identifying information will be used in the dissemination of the results.

By taking part in the interview process, you are showing your consent to take part in the study.

https://wits.eu.qualtrics.com/jfe/form/SV_3xsPhJvaJsLe4Qu

Should you have any questions regarding the study, please feel free to contact me at +27 83644 5193 or 593275@students.wits.ac.za

Thank you for your assistance!

Sincerely,

Elsie Phelane

APPENDIX C: Ethics Clearance certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: WBS/BA593275/705**
PROJECT TITLE	Women participation in Digital Entrepreneurship: A case study of Gauteng province in South Africa
INVESTIGATOR	Miss Elsie Phelane
SCHOOL/DEPARTMENT OF INVESTIGATOR	MM (Digital Business)
DATE CONSIDERED	16 November 2020
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	MINIMAL RISK
EXPIRY DATE	30 JUNE 2021

ISSUE DATE OF CERTIFICATE 25 November 2020 **CHAIRPERSON** _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Mr Alagbaoso

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES