

https://dspace.org/

Factors influencing entrepreneurial intentions of women in the South African digital ecosystem

Danisa, Nombulelo

2021
https://hdl.handle.net/10539/37117

Downloaded from a DSpace repository. https://dspace.org/

Factors influencing entrepreneurial intentions of women in the South African digital ecosystem.

Nombulelo Danisa

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 the field of Digital Business.

Johannesburg, 2021

ABSTRACT

In line with Sustainable Development Goals (SDGs), there have been increasing calls in support of female entrepreneurship in Sub Saharan Africa. The entrepreneurial gender disparity against women in South Africa is a cause for concern considering the important role of female entrepreneurs in the economy. Potential female entrepreneurs face challenges and hostile environments that discourage entrepreneurial spirit. However, with the advent of the digital ecosystem, it is hoped that these institutional barriers would be overcome. Thus, an investigation on the influence of institutional factors and the digital environment on entrepreneurial intentions of women is imperative.

Utilising the Theory of Planned Behaviour within an institutional embedded perspective, a model for the digital economy was inferred to analyse factors affecting female entrepreneurial intention in the South African digital ecosystem. This quantitative study utilised cross sectional data collected for a final sample of 302 females across South Africa.

Results reflected that entrepreneurial intentions of women are positively influenced by favourable perceptions of the cognitive and normative institutional dimensions. However, the regulatory dimension had a positive but insignificant influence with no evidence that the digital environment interacts with the institutional environment to influence entrepreneurial intentions. Therefore, it is recommended that government and policy makers play a leading role in promoting a culture that values female entrepreneurship. This would assist in creating favourable perceptions of the institutional environment and in turn encourage aspiring female entrepreneurs to start their own business.

Keywords: female entrepreneurship, entrepreneurial intention, institutional factors, digital ecosystem, South Africa

DECLARATION

I, NOMBULELO DANISA, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Nombulelo Danisa Signature:

Signed at Johannesburg.

On the 5th day of February 2021

DEDICATION

This thesis is dedicated to my father, the late Justin Danisa, who encouraged me to never stop learning. I hope I continue to make you proud.

ACKNOWLEDGEMENTS

I wish to express my gratitude to my Supervisor Dr Jabulile Msimango-Galawe who, with great patience, helped me through the completion of this report. I remain in awe and I am inspired by your knowledge, wisdom, and ability to impart what seemed at first to be impossible, in such a simple manner.

I am grateful to everyone I have had the pleasure to exchange ideas with and learn from, my colleagues in the 2019 MMDB Part-time Cohort who were more than eager to help me clarify my idea, especially my colleague Hasheel Govind. He encouraged me when I doubted myself and wanted to give up; his constant motivation helped me complete my thesis.

I wish to thank my bosses Doug T Munatsi and Beki Moyo who encouraged me to keep learning and had to suffer some balls dropping in the office because I was not entirely present after sleepless nights of research.

Most importantly I wish to thank my family, my loving husband Ishmael who was my sounding board for every idea I had, from choosing my topic and supporting me right to the end, while patiently listening and offering a new perspective when I was at crossroads. My son Darren, whose energy and encouragement kept me going when I did not feel like writing. Thank you both for your love and support through my studies. To the rest of my family who were denied my physical presence at important family gatherings, or whose calls I returned after a month or still have not returned, thank you for your patience.

TABLE OF CONTENTS

ABSTRACT ..... **ii**

DECLARATION ..... **iii**

DEDICATION ..... **iv**

ACKNOWLEDGEMENTS ..... **v**

LIST OF TABLES ..... **ix**

LIST OF FIGURES ..... **xi**

LIST OF ACRONYMS ..... **xii**

CHAPTER 1. INTRODUCTION **1**

1.1 PURPOSE OF THE STUDY 1
1.2 CONTEXT OF THE STUDY 1
1.3 RESEARCH PROBLEM 4
1.4 RESEARCH OBJECTIVES 5
1.5 SIGNIFICANCE OF THE STUDY 5
1.6 DELIMITATIONS OF THE STUDY 7
1.7 DEFINITION OF TERMS 7
1.8 ASSUMPTIONS 8
1.9 REPORT STRUCTURE 8

CHAPTER 2. LITERATURE REVIEW **10**

2.1 INTRODUCTION 10
2.2 BACKGROUND DISCUSSION 10
2.3 THEORY OF PLANNED BEHAVIOUR (TPB) – ENTREPRENEURIAL INTENTIONS (EI) 11
2.3.1 ATTITUDE TOWARDS BEHAVIOUR 13
2.3.2 SUBJECTIVE NORM 13
2.3.3 PERCEIVED BEHAVIOURAL CONTROL 14
2.4 INSTITUTIONAL THEORY OF ENTREPRENEURSHIP – INSTITUTIONAL FACTORS 14
2.4.1 REGULATIVE DIMENSION 15

2.4.2 HYPOTHESIS 1 (H1) 17
2.4.3 COGNITIVE DIMENSION 18
2.4.4 HYPOTHESIS 2 (H2) 19
2.4.5 NORMATIVE DIMENSION 19
2.4.6 HYPOTHESIS 3 (H3) 21
2.5 THE DIGITAL ECOSYSTEM 21
2.5.1 THE DIGITAL ECOSYSTEM, INSTITUTIONS AND ENTREPRENEURSHIP 23
2.5.2 HYPOTHESIS 4A (H4A) 25
2.5.3 HYPOTHESIS 4B (H4B) 25
2.5.4 HYPOTHESIS 4C (H4C) 25
2.6 CONCLUSION OF LITERATURE REVIEW 25

CHAPTER 3. RESEARCH METHODOLOGY 27

3.1 RESEARCH APPROACH 27
3.2 RESEARCH DESIGN 28
3.3 POPULATION AND SAMPLING FRAME 28
3.3.1 POPULATION 28
3.3.2 SAMPLE AND SAMPLING METHOD 29
3.4 THE RESEARCH INSTRUMENT 30
3.4.1 MEASUREMENT OF FOCAL VARIABLES 31
3.5 PROCEDURE FOR DATA COLLECTION 33
3.6 VALIDITY AND RELIABILITY 33
3.7 DATA ANALYSIS 36
3.7.1 MISSING VALUES ANALYSIS 36
3.7.2 DESCRIPTIVE STATISTICS 36
3.7.3 CORRELATION ANALYSIS 36
3.7.4 REGRESSION ASSUMPTIONS 37
3.7.5 HIERARCHICAL MULTIPLE LINEAR REGRESSION 39
3.7.6 MODERATION ANALYSIS 40
3.8 LIMITATIONS OF THE STUDY 42
3.9 ETHICAL CONSIDERATIONS 42
3.10 CONCLUSION 42

CHAPTER 4. PRESENTATION OF RESULTS 44

4.1 SAMPLE CHARACTERISTICS AND DEMOGRAPHIC PROFILES OF RESPONDENTS 44
4.2 RELIABILITY OF MEASUREMENT SCALE 46
4.2.1 ENTREPRENEURIAL INTENTION 47
4.2.2 REGULATIVE DIMENSION 48
4.2.3 COGNITIVE DIMENSION 48
4.2.4 NORMATIVE DIMENSION 49
4.2.5 DIGITAL ENVIRONMENT 50
4.2.6 SUMMARY OF RELIABILITY ANALYSIS 51
4.3 EXPLORATORY FACTOR ANALYSIS (EFA) 51
4.3.1 SUMMARY OF VALIDITY AND RELIABILITY ANALYSIS 55
4.4 DESCRIPTIVE STATISTICS 55
4.5 CORRELATION ANALYSIS 56

4.6 REGRESSION ANALYSIS 57
4.6.1 REGRESSION ASSUMPTIONS 57
4.6.2 HIERARCHICAL MULTIPLE LINEAR REGRESSION RESULTS 60
4.6.3 MODERATION ANALYSIS 64
4.7 RESULTS AND HYPOTHESES 66
4.8 CHAPTER SUMMARY 67

CHAPTER 5. DISCUSSION OF RESULTS 70

5.1 INTRODUCTION 70
5.2 DISCUSSION PERTAINING TO THE HYPOTHESES 70
5.2.1 REGULATIVE DIMENSION AND EI 70
5.2.2 COGNITIVE DIMENSION AND EI 71
5.2.3 NORMATIVE DIMENSION AND EI 72
5.2.4 DIGITAL ENVIRONMENT AND INSTITUTIONAL DIMENSIONS ON EI 73
5.3 CONCLUSION 74

CHAPTER 6. CONCLUSIONS AND RECOMMENDATONS 75

6.1 INTRODUCTION 75
6.2 CONCLUSIONS OF THE STUDY 75
6.3 RECOMMENDATIONS 76
6.4 SUGGESTIONS FOR FURTHER RESEARCH 78

References 80

APPENDIX A: Research Instrument 88

APPENDIX B: Consistency Matrix 111

APPENDIX C: Ethics Certificate 112

APPENDIX D: Additional Results 113

LIST OF TABLES

Table 1: Research Techniques 30

Table 2: Research Instrument 31

Table 3: Age 44

Table 4: Ethnic group 45

Table 5: Education level 45

Table 6: Province 45

Table 7: Summary of reliability analysis 46

Table 8: Inter-item correlations (Entrepreneurial Intention) 47

Table 9: Inter-item correlations (Regulative dimension) 48

Table 10: Inter-item correlations (Cognitive dimension) 49

Table 11: Inter-item correlations (Normative Dimension) 49

Table 12: Item total statistics (Digital environment) 50

Table 13: Inter-item correlations (Digital environment) 50

Table 14: KMO test 52

Table 15: Total variance explained 52

Table 16: Pattern matrix 53

Table 17: Factor correlation matrix 55

Table 18: Descriptive statistics 56

Table 19: Pearson correlation matrix 57

Table 20: Correlation matrix 58

Table 21: Model summary 61

Table 22: ANOVA 62

Table 23: Regression coefficients 63

Table 24: Regression results of regulative dimension with the digital environment as moderator. 64

Table 25: Cognitive dimension and EI with digital environment as moderator . 65

Table 26: Normative dimension and EI with moderation 65

Table 27: Summary of hypotheses 68

LIST OF FIGURES

Figure 1: Illustration of TBP 13

Figure 2: Conceptual Model of the Digital Ecosystem 22

Figure 3: Research Model 26

Figure 4: Scree Plot 53

Figure 5: Plot of Residuals 60

Figure 6: Homoscedasticity Test 61

LIST OF ACRONYMS

CD – Cognitive Dimension

DEE - Digital Entrepreneurship Ecosystem

DTI - Department of Trade and Industry

EFA - Exploratory Factor Analysis

EI – Entrepreneurial Intent

GEM - Global Entrepreneurship Monitor

ITE - Institutional Theory of Entrepreneurship

ND – Normative Dimension

RD – Regulative Dimension

SDGs- Sustainable Development Goals

SPSS - Statistical Package for Social Sciences

TPB – Theory of Planned Behaviour

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this quantitative method of study is to investigate factors that ignite female entrepreneurial intentions in the South African digital ecosystem. This report focuses on institutional factors, and how these influence the formation of entrepreneurial intentions among females in the digital environmental context.

1.2 Context of the study

Globally, there has been an increase in the number of women venturing into entrepreneurship (Meyer & Mostert, 2016). There has been a general acceptance among policy makers that entrepreneurship can potentially help women achieve their dreams and overcome barriers to career development (Hytti, 2010). This does not end with the individual, but extends through to country level, where employment levels and the economy are positively impacted (Okeke-Uzodike, Okeke-Uzodike & Ndinda, 2018).

Despite the benefits of female empowerment, South Africa still lags in female entrepreneurship development (Gore & Fal, 2019). The Global Entrepreneurship Monitor (GEM) 2017/2018 report revealed that in South Africa, men account for a greater percentage in early entrepreneurial activity (Herrington & Kew, 2018). The GEM statistics show that for every 10 male entrepreneurs, 7 female entrepreneurs engage in early-stage entrepreneurship.

The report further shows a decrease in female opportunity driven entrepreneurship, from 71.6 percent in 2016 to 65.7 percent in 2017, as well as an increase in necessity driven entrepreneurship. This, according to Herrington and Kew (2018) is due to lower education levels, poor business networking, capital constraints, family responsibilities, lack of confidence and cultural and social influences. The Entrepreneurial Dialogues highlights family responsibility as a major factor that contributes to the gender gap in entrepreneurship, as

females usually devote more time to family than men, which leads to men obtaining more time to explore business opportunities (Gore & Fal, 2019).

It is hoped that with the advent of the digital economy, female entrepreneurs now have an opportunity to overcome entrepreneurial barriers through leveraging digital enablers that enhance ease of doing business (Malik, 2017). South Africa has a diverse range of participants in the digital ecosystem. The environment is characterised by dynamic venture development and improved inclusive entrepreneurial support initiatives, which is a stark contrast from the segregated Apartheid era. However, despite these changes, the South African economy continues to experience low growth rates, with unemployment and inequalities prevalent among the youths (National Treasury, 2020).

The Global Entrepreneurship and Development Institute (GEDI) 2017 report ranks South Africa at 65th globally, pointing out that it still lags in technology adoption and digital inclusion. This report recommends that South Africa ramps up its digital inclusion efforts by making digital technologies in the form of broadband, spectrum, and information technology (IT) connectivity accessible and easy to use for the country's greater population. According to the 2014 United Kingdom (UK) Digital Inclusion Strategy, "helping more people to go online can also help tackle wider social issues, support economic growth and close equality gaps" (GEDI, 2017).

The role of female entrepreneurs in economic development should not be overlooked, as research revealed that support for female entrepreneurs is lacking (Mandipaka, 2014). Women in South Africa continue to face credit access barriers, skills development, and educational opportunity exclusions (Gore & Fal, 2019). The lack of digital entrepreneurship training and knowledge sharing, and access to capital and financial skills continues to be a barrier to entrepreneurship for female entrepreneurs. Improvements in awareness and perception of entrepreneurship is important for economic transformation (Swartz, Marks, & Scheepers, 2020).

Several formal organisations including university-based initiatives were established to support entrepreneurs. These include the University of Cape

Town, University of Pretoria, and Stellenbosch University, where accelerators and incubators are emerging (Swartz et al., 2020). The LaunchLab has graduated several organisations in the areas of agri-tech and food, clean-tech, paid media, edu-tech, fin-tech, and big data.

Government initiatives to support female entrepreneurs have also been set up through the Department of Trade and Industry (DTI), such as the Isivande Women's Fund (IWF), to provide favourable financial solutions to women owned businesses (Mandipaka, 2014). Technology for Women in business (TWIB) is another DTI programme which facilitates access to networks and support for female entrepreneurs in the ICT space. Since TWIB's introduction, many women have been given the opportunity to leverage technology to expand their business operations (DTI, 2012).

Other governmental agencies include Khula Enterprise Finance Limited and Ntsika Enterprise Promotion Agency which are aimed at improving access to loans and equity capital to Small Medium and Micro Enterprises (SMMEs). Ntsika Enterprise Promotion Agency also assists entrepreneurs in entrepreneurial and business training, business networks and information search.

Informal support for women entrepreneurs exists in the form of free credit and advice from friends, relatives, and business partners. Of great importance is the role of informal institutions which encompass norms and values of society, attitude towards entrepreneurship and social acceptance. According to the GEM 2018 report, South African entrepreneurial culture is weak, characterised by welfare grant dependency, a hand to mouth me-too business mentality with a high failure rate, thereby entrenching negative perceptions about entrepreneurship (Herrington & Kew, 2018).

We live in the digital age and countries, organisations and entrepreneurs who do not embrace the digital ecosystem are likely to lag from a technological standpoint. It is hoped that South African female entrepreneurs will be motivated to leverage the associated benefits that the digital ecosystem presents in order to reduce the gender divide in the entrepreneurial space.

The Entrepreneurial Dialogues report also notes that female entrepreneurs in South Africa receive less recognition and they lack both formal and informal entrepreneurial skills (Gore & Fal, 2019). W. Li, Du, and Yin (2017) emphasised the importance of institutional support for females as they are increasingly turning to entrepreneurship as a necessity. Thus, the role of the institutional environment in facilitating the entrepreneurship process can not be overlooked. It is therefore against this backdrop that we should examine the institutional factors that shape female entrepreneurial intentions.

1.3 Research problem

The entrepreneurial gender disparity against women in South Africa is a cause for concern considering the important role of female entrepreneurs in the economy in terms of innovation, employment and wealth creation (Meyer & Mostert, 2016). According to the GEM 2017/2018 a significant gender gap exists in the entrepreneurship landscape where women only account for 31 percent of South Africa's entrepreneurs (Herrington & Kew, 2018). The advent of the digital economy has improved the entrepreneurial ecosystem because of the ease of conducting business (Malik, 2017). However, generally, it is believed that females adopt technology at a lower rate than males (Kamberidou, 2020). As such, women need strong institutional support systems if the gender gap is to be reduced and for the economy to benefit from women's enhanced involvement.

The entrepreneurial space has been male dominated for decades but the gap has been slowly shrinking as women are forced by necessity to be entrepreneurs. Women's entrepreneurship ambitions have however been hampered by the need to have a husband and/ or a male family member along to sign off any initiatives (Mandipaka, 2014). Female entrepreneurs are subjected to barriers that create hostile environments when compared to their male counter-parts and these challenges include *inter alia*, discrimination, lack of education and training, lack of exposure to markets, and difficulty in acquiring capital (Matiwane, 2005).

Understanding the formation of EIs is key in entrepreneurship development, more especially in emerging economies like South Africa (Urban, 2013a). Literature

recognises that the digital environment can ease the burden on females and increase their chances of becoming entrepreneurs (Kamberidou, 2020; Malik, 2017). Shaw and Urban (2011) note that the institutional profile of a country, that is, the regulative, normative, and cognitive dimensions directly and indirectly affect entrepreneurial intentions. However, literature on how the institutional environment of a country interacts with the digital ecosystem in shaping EIs of females remains scarce. As such, it becomes imperative to investigate the influence of the institutional environment on female EIs in the digital ecosystem as this will help in building an enabling environment for aspiring female entrepreneurs to partake in the entrepreneurial ecosystem.

1.4 Research objectives

The main objective of this research is to investigate the influence of institutional factors on female entrepreneurial intentions in South Africa as well as the moderating effect of the digital environment on this relationship.

The sub-objectives are:

1. To investigate the influence of the regulatory dimension on female entrepreneurial intention.
2. To investigate the influence of the cognitive dimension on female entrepreneurial intention.
3. To investigate the influence of the normative dimension on female entrepreneurial intention.
4. To investigate the moderating effect of the digital environment on the influence of institutional dimensions on female entrepreneurial intention.

1.5 Significance of the study

The need to promote and develop entrepreneurship has taken centre stage in many countries especially in South Africa, as governments aim to achieve economic prosperity. This study acknowledges various studies on how entrepreneurial intentions are affected by the institutional factors in different countries' contexts (Díaz-Casero, Ferreira, Mogollón, & Raposo, 2012; Fatoki,

2010). Other studies also compared intentions across the gender divide (Malebana,2015). The contribution of female entrepreneurs to the South African economy was investigated by Mandipaka (2014) whereas Meyer and Mostert (2016) focused on the barriers and success factors of female entrepreneurs enrolled in an entrepreneurial program.

Despite the presence of studies on the impact of the institutional environment on EI (Shaw & Urban, 2011; Urban, 2013a), little has been done on analysing female entrepreneurial intentions, which this study intends to focus on, with an added angle of the moderating effect of the digital environment. Therefore, this study makes an important contribution by extending literature on under-researched factors that affect entrepreneurial intentions.

The digital age and technological developments are changing business models from traditional to platforms that leverage exponential networks, reducing transaction costs supported by connectivity and mobility. Women stand to benefit from the convenience of working and doing business anytime and anywhere. This aids in work life balance and higher productivity with a resultant contribution to employment and economic development (Kamberidou, 2020). However, for female entrepreneurial intentions to be ignited and developed into successful entrepreneurial sustained activity, strong institutional support will be instrumental. As such, this study hopes to guide and assist future researchers in assessing the combined influence of the digital environment and institutional factors in shaping female entrepreneurial intentions in South Africa.

If female entrepreneurship development is regarded as a key driver of inclusive economic growth and development, a better understanding of the role of the institutional environment in influencing women's entrepreneurial intentions is required. The findings will assist government and policy makers to accurately develop targeted policies, cultivate a socially inclusive environment and knowledge sharing culture for female entrepreneurs to thrive as well as reduce the gender gap. It will also assist the business community to engage better with its female stakeholders from a financial and network support perspective, while the aspiring female entrepreneur will be educated on existing possibilities in the entrepreneurial ecosystem.

1.6 Delimitations of the study

The scope of this study is limited to:

i. The South African context
ii. Institutional factors which are:
    a. Regulative dimension (South Africa's laws, policies and business support initiatives among others)
    b. Cognitive dimension (entrepreneurial knowledge, skills, training and education)
    c. Normative dimension (social norms, values and beliefs regarding female entrepreneurs in South Africa)
iii. Female entrepreneurial intentions from an institutional theoretical point of view that is limited to the above dimensions.
iv. Females across South Africa with a tertiary education.

1.7 Definition of terms

i. *Digital ecosystem*- is an environment where there is wide use of digital facilities such as software, applications, mobile phones, digital banking facilities (J. Li, Westbrook, Callen & Georgiou, 2012).
ii. *Entrepreneurship*- is the ability to realise and act on opportunities in one's environment to produce and convert dreams into projects that facilitate living (Bozkurt, 2000).
iii. *Entrepreneurial Intention (EI)*- is the willingness to start a business or become self- employed (Nguyen, 2018).
iv. *Institutions*- "Rules of the game" of a society (North, 1990). Also referred to as institutional environment and used interchangeably in this report.
v. *Institutional dimensions*- Kostova (1997) defines an institutional dimension or profile as "a set of all relevant institutions that have been established overtime, operate in that country and get transmitted into organisations by individuals". These are made up of the regulatory, cognitive, and normative dimension.
    - *Regulatory dimension*- involves aspects like government rules, regulations, and policies that support businesses, as well as

facilitating entrepreneurship effort (Busenitz, Gomez, & Spencer, 2000).

- *Cognitive dimension*- consists of the knowledge and skills of individuals regarding business start-ups (Farashah, 2015)
- *Normative dimension*- it measures the degree to which entrepreneurship is valued by society (Busenitz et al., 2000)

1.8 Assumptions

In order to complete this research, the following assumptions were raised:

i. The respondents have enough knowledge about entrepreneurship and their responses are truthful and representative of their intentions.
ii. The respondents have some knowledge of and the workings of the digital environment.

1.9 Report Structure

The rest of this report is organised as follows:

Chapter 2: This is the literature review in which the key terms and concepts pertaining to the study are elaborated. The key terms for this study are entrepreneurship, institutions, institutional dimensions, entrepreneurial intension and digital ecosystem. At the end of the literature review hypotheses are stated as possible solutions to the research objectives posed in Chapter 1.

Chapter 3: This division of the report is about the methodology of the study, it aims to address the hypotheses that arose from the literature review and that were put forward as possible solutions to the research objectives. In this segment, the research approach, research design, population and sample, research instrument, procedure for data collection as well as procedures for data analysis and interpretation are outlined.

Chapter 4: In this chapter, the results of the research methodology outlined in chapter 3 are presented in line with the objectives of the study.

Chapter 5: This section discusses and explains the results within the context of the literature reviewed in chapter 2. Thus, in this chapter, a detailed discussion pertaining to the hypotheses is presented and the results are compared and contrasted with the literature.

Chapter 6: In this last chapter, the results of the study are integrated into the original research objectives outlined in Chapter 1, and answers to each research objective are provided. Thereafter, policy recommendations are drawn from the conclusions and areas for further research are suggested towards the end of the chapter.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter focuses on reviewing theoretical and empirical literature on the topic of study. In this chapter, key constructs of the study are discussed, the theoretical foundation of the problem is laid out, and hypotheses are formulated. The chapter begins by defining entrepreneurship and entrepreneurial intention; this is followed by a review of the theory of planned behaviour, the institutional theory of entrepreneurship and the digital ecosystem. The final part of the chapter outlines each objective and hypotheses and the conceptual model is presented.

2.2 Background discussion

Entrepreneurship has become increasingly important in the modern world as it plays a crucial role in economic development (North, 1990). It helps resolve economic burdens like unemployment, poverty and low economic growth (Busenitz et al., 2000). Traditionally, it was implicitly believed that most entrepreneurs would be men, this is mainly due to the fact that most businesses in the past were male dominated (Estrin & Mickiewicz, 2009). However, the situation has changed; policy makers and governments across the globe are now paying attention to gender issues in entrepreneurship in line with Sustainable Development Goals (SDGs) which aims to achieve gender equality by 2030. As stipulated in the SDG 2030 Agenda for Sustainable Development, gender equality and women's empowerment in entrepreneurship is now at the centre of its efforts to speed up progress towards development goals (SDGfund, 2020).

The phenomenon of female entrepreneurship is increasing globally, leading to the emergency of a large body of literature analysing aspects such as entrepreneurial intentions, barriers for female entrepreneurial success and the role of institutions in female entrepreneurship (Chinomona & Maziriri, 2015; Estrin & Mickiewicz, 2009; Kamberidou, 2020; Meyer & Mostert, 2016). Women across the world face several barriers preventing them from realizing their full potential (Okeke-Uzodike et al., 2018). Kamberidou (2020) posits that women in

entrepreneurship continue to face challenges in terms of financial capital, skills and limited access to business networks and digital devices and access to connectivity.

The socio-economic environment of a country shapes the entrepreneurial behaviour of individuals in that particular country (Kostova, 1997). Literature acknowledges that the entrepreneurial ecosystem is largely affected by the external environment of a country (Busenitz et al., 2000; Kostova, 1997), which includes the institutions of a country. The three dimensions of the institutional profile of a country were introduced by Kostova (1997) and the following section discusses the relationship between institutional dimensions and entrepreneurship.

In literature, entrepreneurship is defined in different ways. Spencer and Gómez (2004) highlight aspects of risk and uncertainty as key aspects of venture creation whereas Schumpeter and Redvers (1934) identify innovation and ground breaking ideas, new products, and new markets as part of the entrepreneurship process. In the same vein, Eckhardt and Shane (2003) develop the idea further by adding the exploiting, identifying, and evaluating of opportunities to make new products for profit.

There are also various operational definitions of entrepreneurship in literature including Engle, Schlaegel and Dimitriadi (2009) who see entrepreneurship as the commencement of a business venture. This definition is widely used in entrepreneurship literature especially for emerging economies (Shaw & Urban, 2011). This study therefore follows the Engle et al. (2009) definition, thus regarding entrepreneurship as the formation of a new business venture by females in South Africa.

2.3 Theory of Planned Behaviour (TPB) – Entrepreneurial Intentions (EI)

Successful entrepreneurship is regarded as an offshoot of entrepreneurial intent (Naushad, Faridi & Malik, 2018). Entrepreneurial intention is regarded as a state of mind that seeks to create new ventures and develop new business concepts

(Bird, 1988). Davidsson (1995) points out that the decision to start a business is planned over time and is preceded by intention. Intention however may not lead to action, implying that it may be an imperfect predictor of entrepreneurial activity. The definition of entrepreneurial intention used in this study is given by Engle et al. (2009) and Nguyen (2018) who define it as an individuals' openness to venture into self-employment. This is in line with the view adopted in this report and coincides with the definition of entrepreneurship adopted.

Several different measures of entrepreneurial intention categorised into short- and long-term intentions were suggested in literature (Reitan, 1996). Short term intentions are measured by the likelihood of engaging in new business in two years, whereas long term intentions are longer (Reitan, 1996). This study, however, adopts GEM's definition of entrepreneurial intention, regarding it as the latent, non-entrepreneur population aged between 18- 64, who aspire to engage in entrepreneurial activity within the next three years (Herrington & Kew, 2018).

The study of EIs is generally built from the TPB by Ajzen (1991) which is considered a benchmark model for studying intention across populations of different characteristics (Bird, 1988) . A person's intention to perform an action is a central factor in this theory (Ajzen, 1991). Intention is influenced by attitude towards behaviour, perceived behavioural control and the subjective norm (Autio, Keeley, Klofsten, Parker & Hay, 2001). The theoretical model is depicted in Figure 1 and discussed in detail thereafter.

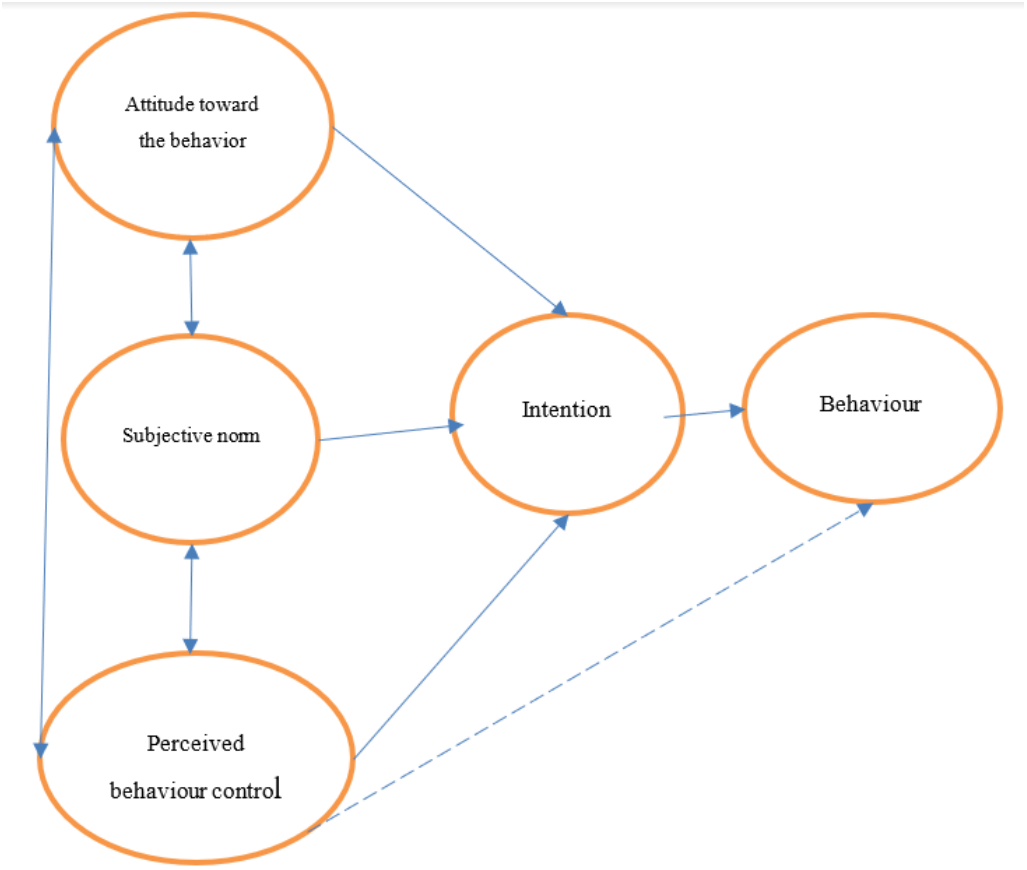


Figure 1: Illustration of TBP (Ajzen, 1991)

2.3.1 *Attitude towards behaviour*

This element considers the extent to which an individual favours or dislikes the behaviour in question. Thus, to decide on a course of action, an individual will consider all the available information and the consequences which influence their behaviour. Positive outcomes emanating from behaviour will lead to performance of action.

2.3.2 *Subjective Norm*

Subjective norms refer to perceptions and opinions of others, in society, regarding the proposed behaviour. This in turn has an influence on whether the behaviour will be executed or not (Farashah, 2015).

2.3.3 *Perceived behavioural Control*

Perceived performance capability may hinder or encourage behaviour depending on available resources whether these are skill-related, physical or financial. Normally, people pursue behaviours they believe they will be able to execute in the case of extenuating circumstances.

Several studies have applied the TPB in studying entrepreneurial intention. Liñán and Chen (2009) and Sivarajah and Achchuthan (2013) went further to test a model adapted from the TPB and concluded that the model was adequate for studying entrepreneurial behaviour across all nations. This was supported by Nabi, Linan, Iakovleva, Kolvereid, and Stephan (2011) who concluded that the theory can be applied in countries of all income levels, arguing that it is reliable and consistent. This report, however, does not intend to test the validity of this theory but rather use it as a conceptual model which encompasses the three predictors of intention from the theory. It embeds them into an institutional framework in the analysis of female entrepreneurial intentions in South Africa.

2.4 Institutional theory of entrepreneurship – Institutional factors

The theoretical basis of this study attempts to explain the link between the institutional environment and entrepreneurship. Institutional theory is of considerable importance when it comes to studying entrepreneurship (Kazumi & Kawai, 2017). Applying institutional theory to entrepreneurship has become increasingly important because entrepreneurship is an economic behaviour embedded in the institutional framework of a country (Baumol, 1990). Institutions are viewed as “rules of the game” that shape the course of an individual’s behaviour or beliefs. These institutions have been broadly categorized into formal and informal institutions (North, 1990).

Formal institutions consist of government policy and regulatory guides that shape entrepreneurial behaviour (North, 1990). Government policies and regulations have direct and indirect impacts on business activity, for example, high level taxes may deter investment. High compliance costs and bureaucracy in obtaining

business licences may also act as a barrier to entrepreneurship. Informal institutions, on the other hand, consist of the normative and cognitive dimension norms, traditions, customs, value systems and religions, and knowledge that govern human interaction (Scott, 1995). The way society values entrepreneurship and society's knowledge and skills have a direct influence on entrepreneurial behaviour.

The GEM 2017/2018 report acknowledges that entrepreneurial intentions in South Africa are adversely influenced by institutional factors such as red tape, labour regulations, corruption, lack of education among others (Herrington & Kew, 2018). When applying institutional theory to entrepreneurial intentions, Spencer and Gómez (2004), Engle et al. (2009) and Shahid, Imran and Shehryar (2018) introduced the three institutional dimensions that govern human behaviour, which are the normative, regulative and cognitive dimensions.

Prior studies have examined the link between a country's institutional framework and entrepreneurial intention in general. Institutional factors like lack of belief in oneself, inexperience, poor education, financial constraints, and poor business networks have been found to inhibit aspiring entrepreneurs from starting their own business ventures (Herrington & Kew, 2018; Urban, 2008). There are previous empirical studies that have attempted to establish the influence of institutional factors on female entrepreneurship (Kazumi & Kawai, 2017), concluding that informal institutional support for women has a positive impact on entrepreneurial self-efficacy in Japan. Yousafzai, Saeed and Muffatto (2015) found that the regulatory institutional dimension has a positive influence on women entrepreneurship. This study differs in that it applies institutional theory on entrepreneurial intentions of females in the digital ecosystem. The three dimensions of institutions are analysed in detail below.

2.4.1 *Regulative dimension*

The regulative institutional dimension is made up of government rules, regulations and policies that incentivise, constrain and regularize human behaviour (Spencer & Gómez, 2004). Government has at its disposal various tools that it can use to regulate business activity in a country. These tools include

aspects of the macroeconomic policy environment such as tax policy, labour laws and businesses legislation enacted through parliament. Taxes levied on businesses have an effect on business start-ups. High taxes may discourage new investments and also strict labour market regulations discourage start-ups as entrepreneurs struggle to cope with the costs associated with such regulations. The regulative environment offers physical and emotional incentives that remove the negative perception regarding entrepreneurship (Farashah, 2015).

However, in instances where the environment is hostile to particular entrepreneurial activities, entrepreneurship is discouraged due to increased difficulties in obtaining the required business licences and permits (Garcia-Cabrera, Garcia-Soto, & Dias-Furtado, 2018). Government may implement support policies for new businesses, and reduce risks associated with starting a new business by offering tax incentives and financial support in the form of grants and protection of property rights to promote investment. For instance, the Broad Based Black Economic Empowerment (BBBEE) Act 53 of 2003 was enacted to accelerate economic transformation by supporting previously disadvantaged groups (BBBEC, 2017), and in this group, women are top on the list. The regulatory dimension has a strong influence on an individual's decision to venture into entrepreneurship (Kujinga, 2016).

Research has indicated that a favourable regulatory environment has positive implications on the formation and growth of new ventures in South Africa (Bosma, Wennekers, & Amorós, 2011). Countries with strong regulatory institutions usually have higher levels of entrepreneurial intentions (Farashah, 2015). Research has found evidence that resources offered by government for entrepreneurial support, tax incentives, business development assistance, universities, and export incentives can aid individual entrepreneurial efforts (Herrington & Kew, 2018; Spencer & Gómez, 2004). As such, the regulatory dimension has a strong effect on an individual's EI (Kujinga, 2016).

Despite the various support programs under the regulatory dimension that are offered to women in South Africa under the DTI, the gender gap remains wide, with fewer women expressing entrepreneurial intention (Herrington & Kew, 2018). The GEM and the Entrepreneurial Dialogues reports highlight that accessing

finance and government support sponsored start-up capital is not easy in South Africa and many people are not aware that such government support initiatives exist (Herrington & Kew, 2018). Other impediments to female entrepreneurs in South Africa include lack of education training, lack of access to finance, and inadequate resources (Chinomona & Maziriri, 2015).

Thus, factors that inhibit entrepreneurship include uncertainty and inconsistencies in government policies and burdensome procedural requirements (Spencer & Gómez, 2004). Bureaucracy, corruption, inadequate subsidies, high tax rates also increase and heighten complexity and risk associated with business creation. (Farashah, 2015). Conclusions were also drawn from different studies in different countries where researchers emphasized that females should be given the necessary help to start a business, pointing out that lack of access to bank funding is hindering their entrepreneurial prospects (Welter & Kolb, 2006).

This study is therefore driven by the need to get more female entrepreneurs engaged in the mainstream economy to bridge the entrepreneurial gender divide by leveraging digital tools for the digital ecosystem. As such, the regulative institutional framework of a country should play a vital role in encouraging more women to participate and venture into entrepreneurship.

In conclusion, government has a role to play in encouraging entrepreneurship through creation of a supportive regulatory environment, especially targeting women, and fostering entrepreneurship through education and training, financial support, and consistent government policies. A supportive regulatory environment would increase entrepreneurial intentions of women in South Africa. In recognizing the influence of the regulatory dimension in shaping entrepreneurial intentions, this study proposes the following hypothesis:

2.4.2 ***Hypothesis 1 (H1)***

Favourable perceptions of the regulative dimension have a positive influence on female entrepreneurial intention.

2.4.3 *Cognitive Dimension*

The cognitive dimension is made up of aspects such as information, skills and knowledge that individuals have that are used to interpret and evaluate situations and opportunities (Spencer & Gómez, 2004). This dimension describes ideologies and logics that are widely shared and are deep rooted in a social setting (Garcia-Cabrera et al., 2018).

Entrepreneurial behaviour is realised as a function of an individual's underlying cognitions (Urban, 2013b). Busenitz et al. (2000) note that information and knowledge sets have become institutionalised within countries and thus access to knowledge and skills add to one's confidence and locus of control, thus becoming key determinants of entrepreneurial intention. Knowledge and skills may be acquired from higher level technical training programs or learning from experiences of those already in business (Garcia-Cabrera et al., 2018). Generally, the cognitive dimension also encompasses aspects of self- efficacy and human capital.

Self-efficacy refers to one's perceived ability and capability to execute a behaviour (van der Westhuizen & Goyayi, 2020). Farashah (2015) notes that entrepreneurial self-efficacy, which he defines as an individual's judgement of his or her ability to successfully start a business, has become an important antecedent to EI. Individuals who perceive themselves as having greater abilities to do better in business are likely to demonstrate greater intention to venture into entrepreneurship (Farashah, 2015). Self-efficacy has also been found to be greatly influenced by availability of information and use of ICT as people are constantly looking for ways of utilizing digital opportunities in venture start-ups (van der Westhuizen & Goyayi, 2020).

Empirical research has shown that entrepreneurship promotion programs are a persuasive catalyst through demonstration of possible success and good social and economic benefits (Farashah, 2015). As such policy frameworks under the cognitive dimension may focus on increasing access to information which in turn increases positive perceptions. Education, skills, training and experience were found to influence entrepreneurial intentions in emerging economies (Urban,

2013b). Applying a socio-cognitive model of entrepreneurial career, Farashah (2015) found that access to information and personal experience were positively related to entrepreneurial intentions.

This study takes a gender sensitive approach in analysing the extent to which the cognitive dimension influences female EI, a line of research that has not received wide attention in South Africa. Dennis Jr (2011) acknowledges the role of institutional support for women, pointing out that offering institutional support packages like training and education empowers women, thus perceiving themselves as capable of starting a business venture. Westhead and Solesvik (2016) found that entrepreneurship education has a positive effect on intention. They further suggested higher levels of connection alertness skills result in a higher intensity of intention for female students. Huarng, Mas-Tur and Yu (2012) point out that the level of education, occupational and sectorial experience, business expertise and managerial skills affect entrepreneurial intention.

With a number of studies agreeing that a country's cognitive environment influences entrepreneurial behaviour (Busenitz et al., 2000; Farashah, 2015; Spencer & Gómez, 2004; Urban, 2013c) in South Africa, most people, especially women (Meyer & Mostert, 2016), lack skills, business knowledge and resources in their ability to start new business ventures (Herrington & Kew, 2018; Urban, 2013a). From the discussion on the cognitive dimension, education, skills and knowledge are regarded as important determinants of individuals' decision to venture into entrepreneurship. Therefore, this report hypothesises the following:

2.4.4 ***Hypothesis 2 (H2)***

Favourable perceptions of the cognitive dimension have a positive influence on female entrepreneurial intention.

2.4.5 ***Normative Dimension***

The normative dimension measures the extent to which residents of a country admire entrepreneurship, innovative thinking and value creativity (Busenitz et al., 2000). Values, norms and cultural beliefs are some of the factors that affect

entrepreneurial orientation under the normative dimension. Norms and values encompass social definitions of what is good for society and these have an influence on an individual's evaluation of entrepreneurial processes (Garcia-Cabrera et al., 2018). Urban (2013c) argues that normative mechanisms are a result of a society's structure which governs entrepreneurial behaviour. Under this dimension, beliefs and expectations of people influence who will and who will not become an entrepreneur (Krueger, Reilly, & Carsrud, 2000).

Cognizant of the influence that the normative dimension may exert on intentions, there have been widespread calls for countries to reorient their values and behaviour towards entrepreneurship (Urban, 2013b). Therefore, this places greater emphasis on the need to promote a culture that values entrepreneurship in a society. A low value perception of entrepreneurship may be the result of associations of entrepreneurship with negative connotations of uncertainty and criminality leading to resistance in some cultures (Baumol, 1990). On the influence of culture, it was found that societal acceptance of entrepreneurship positively influences entrepreneurial activity (Krueger et al., 2000).

Consistent with this report, a number of studies have examined the impact of culture, beliefs and norms, indicating that the role of women in the entrepreneurial ecosystem is often not appreciated (Kamberidou, 2020). A country or society that values women entrepreneurship, and supports them from grassroots to fruition, may encourage aspiring female entrepreneurs to initiate entrepreneurial activity. Negative attitudes towards women in business and gender disparities affect willingness of females to be actively involved in entrepreneurship (Vossenberg, 2016).

Chinomona and Maziriri (2015) found that gender discrimination and negative perceptions from members of the community and family members discourages women from taking part in business start-ups. As such, there is a strong need for social support of female entrepreneurs so that their contribution is recognised, valued, and accepted in the country. This would invigorate entrepreneurial aspirations in females.

In conclusion, the normative dimension concerns issues to do with social norms, principles and ideologies, which are related to human behaviour, which have been found to influence individual intentions to venture into entrepreneurship (Farashah, 2015; Krueger et al., 2000; Westhead & Solesvik, 2016). As such, acknowledging the influence of the normative institutional dimension, the following hypothesis is proposed:

2.4.6 ***Hypothesis 3 (H3)***

Favourable perceptions of the normative dimension have a positive influence on female entrepreneurial intention.

2.5 The Digital Ecosystem

The terms digital environment, economy, or ecosystem, for the purpose of this study are used interchangeably, consisting of organisations, processes and people who are transforming business through engaging digital tools, platforms, models, skills, methodologies and mind sets. Sussan and Acs (2017) integrated the concepts of entrepreneurship and digital ecosystems to develop a model for the digital entrepreneurial ecosystem (DEE). They note that literature has overlooked the role of digital technologies, overlooking how institutions and behaviour of entrepreneurs may change as a result of developments in the digital space.

The DEE is made up of digital infrastructure, digital users, digital entrepreneurship and the digital marketplace (Sussan & Acs, 2017). Digital infrastructure is said to include technological components and network systems which links users at local, national as well as at global level. Digital users refer to anyone who has access to digital technologies, whereas digital entrepreneurship involves doing business in the digital space (Sussan & Acs, 2017).

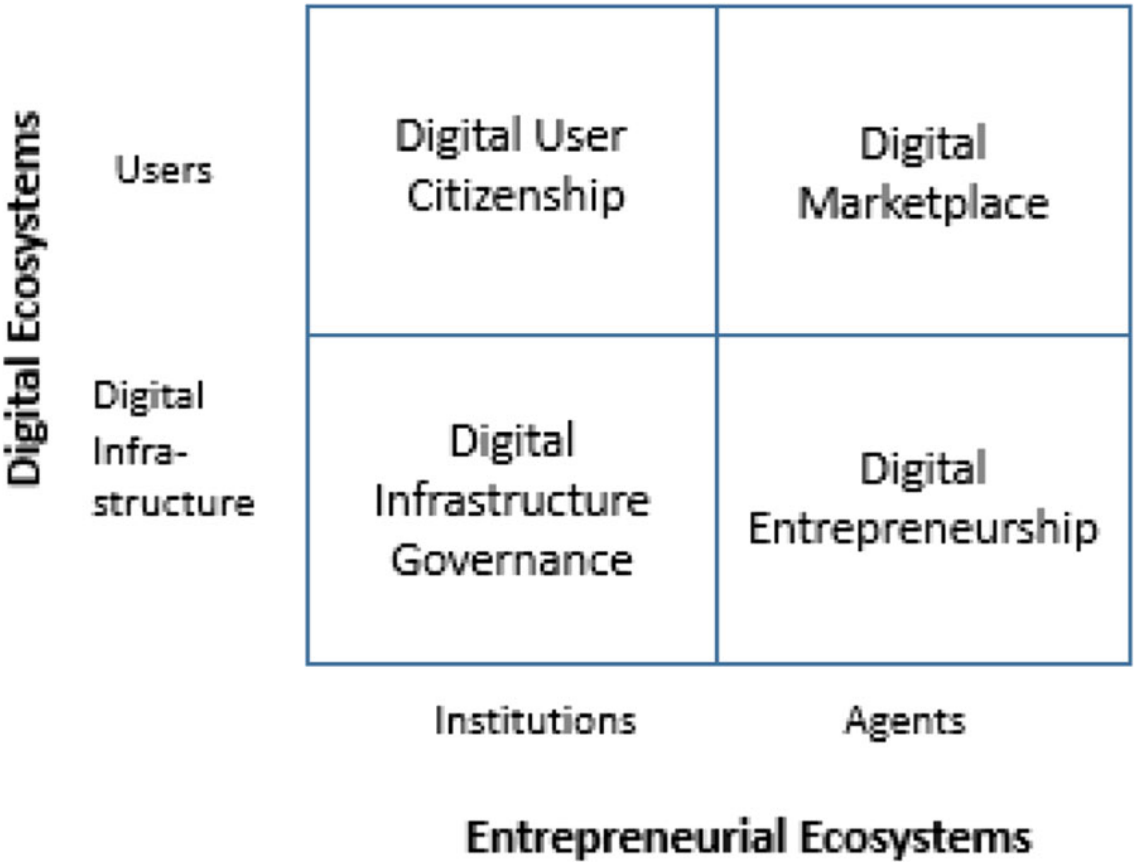


Figure 2: Conceptual model of the digital ecosystem (Sussan & Acs, 2017).

The DEE is made up of four interrelated pillars which make it sustainable. In the digital ecosystem, users and agents (entrepreneurs) utilize digital infrastructure innovatively and creatively. Outcomes of their work are put in the digital marketplace in the form of e-businesses, e-health and e-government among other digital outcomes (Sussan & Acs, 2017). As such, digital users and institutions converge in the digital ecosystem. Institutions (both formal and informal) enable users to participate in the digital environment by enforcing legal and social contracts (Sussan & Acs, 2017). Entrepreneurs, both active and aspiring, exploit opportunities that come as a result of participation of users in the ecosystem thereby initiating entrepreneurial activity. Therefore, this model of the digital ecosystem is helpful in this report as it sheds light on how players in the digital space interact and how they initiate entrepreneurial activity.

2.5.1 The Digital Ecosystem, Institutions and Entrepreneurship

The use of digital technologies has changed the entrepreneurial ecosystem through leveraging the internet to execute business processes or launch a new business or create new business platforms to gain market traction and scalability (Giones & Brem, 2017). Digital technologies are considered enablers to entrepreneurial transformation and activity (von Briel, Davidsson & Recker, 2018). The resulting elements take many forms including IT enabled innovations, digital platforms, digital centred products and services and digital infrastructures (Nambisan, 2017).

Steininger (2018) found that IT plays a key role in entrepreneurship, pointing out that information systems act as facilitators and mediators of venture creation. IT facilitates flow of business information and operations, making starting a business easier. Dong (2018) argues that digital entrepreneurship has been studied mainly in the contexts of free markets, this left a gap in studying the same in the regulatory environment. According to Dong (2018), digital transformation may enable entrepreneurs to overcome barriers that come from the regulatory environment. Drawing from this argument, this report considers the possibility that the digital ecosystem may influence perceptions of females about the regulative dimension of the institutional profile of a country.

Zhang and Li (2017) presented evidence on IT access and entrepreneurship performance in China as well as the interaction effect between IT and social capital. They concluded that access to mobile communication and internet has a positive influence on the performance of entrepreneurs, whereas IT interacts positively with social capital. The digital ecosystem presents an opportunity for gathering information on new products and evaluating different options. Thus, it acts as a source of knowledge for participants, which in turn enhance entrepreneurial operations (Elia, Margherita & Passiante, 2020).

The underlying drivers of entrepreneurial intention debates have received wide attention in literature (Autio et al., 2001; Farashah, 2015; Shahid et al., 2018). Again, despite the presence of literature that links the digital ecosystem to

entrepreneurship, there is scarcity of studies on entrepreneurial intentions in the digital space. Thus, the role of the digital environment and its influence on entrepreneurial behaviour remains an under-researched area (Albashrawi & Alashoor, 2017; Dutot & Van Horne, 2015). In addition to the institutional factors, this study integrates the theory of planned behaviour and institutional theory with the interaction effect of the digital economy and institutional dimensions on entrepreneurial intentions.

By leveraging technology, digital organisations improve the customer journey and in turn achieve customer lifetime value and sustained business. They achieve operational efficiency and reap the rewards of reduced transactional cost benefits of exponential networks (Dahlman, Mealy, & Wermelinger, 2016). The advent of the digital world has seen many businesses marketing their products on digital platforms and also performing all transaction digitally. This has improved businesses convenience and enabled firms to target a wider customer base.

This study also recognizes the negative impact of a digital transforming economy in that unemployment levels soar through job losses because of digitalisation and automations as artificial intelligence and machine learning replace mundane activities (Fonseca, 2018). In the same breath, an opportunity for new jobs with new skill sets and more responsibility emerge, for example, in Germany for each job lost, 2.4 new jobs were created (Fonseca, 2018). It is important for women to get involved in transforming digitally earlier on because the wider the digital gap, the more difficult it is to catch up (Moon, Hossain, Kang & Shin, 2012).

Research indicates that entrepreneurial success requires a high degree of innovation made possible by digital skills (Kamberidou, 2020). Prior studies acknowledge the digital economy will help women overcome the barriers they face in starting business and becoming successful entrepreneurs through leveraging low transaction costs, access to social networks and work life balance (Malik, 2017). It must be noted however that all these benefits without digital access nor digital training or knowledge transfer may hinder entrepreneurial aspirations. Therefore, a deliberate conscious effort by business, society, and government to improve digital literacy must be a priority. This ties in with the cognitive dimension discussed in the TPB as key drivers for perception,

embracing the digital environment to spur rather than scare aspiring female entrepreneurs into entrepreneurs should be the goal (Arbache, 2018).

In summary, it can be inferred from literature that the digital ecosystem interacts with institutional factors through access to information, education and skills development, as well as facilitating ease of starting and operating new business ventures. Thus, the digital environment, in particular, moderates the relationship between institutional factors and entrepreneurial intention. With this recognition, the following hypotheses are formulated:

2.5.2 Hypothesis 4a (H4a)

Perceptions of the digital environment moderate the influence of the regulative dimension on EI.

2.5.3 Hypothesis 4b (H4b)

Perceptions of the digital environment moderate the influence of the cognitive dimension on EI.

2.5.4 Hypothesis 4c (H4c)

Perceptions of the digital environment moderate the influence of the normative dimension on EI.

2.6 Conclusion of Literature Review

Theoretical and empirical analysis has shown that the institutional environment of a country may influence decisions to venture into entrepreneurship. Literature also acknowledges that the digital environment affects entrepreneurial operations, and in relation to this report, it interacts with the institutional dimensions. As such, the conceptual model as hypothesised in this study is depicted in Figure 2.

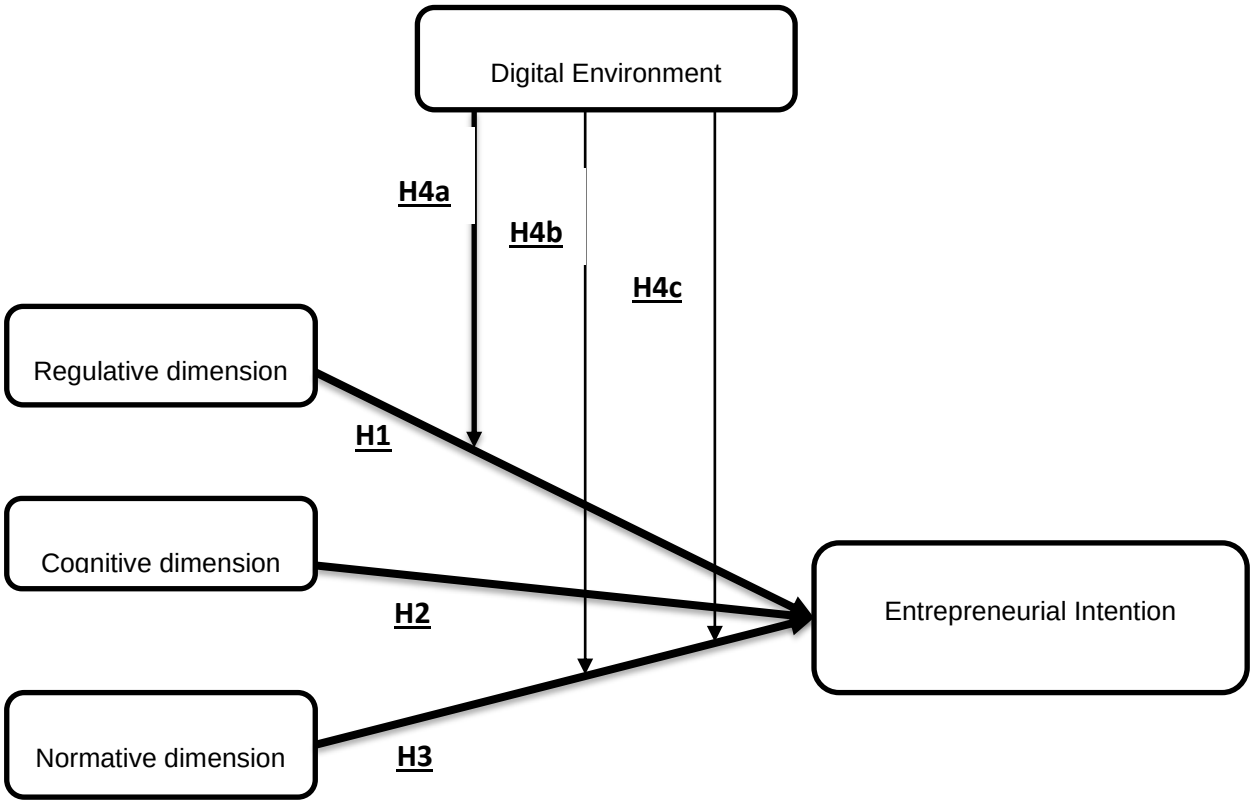


Figure 3: Research Model. *Source: Construction based on the ITE and TPB.*

CHAPTER 3. RESEARCH METHODOLOGY

The empirical model used, research approach and design, sample size and sampling procedure, and definition of variables are presented in this chapter. The data collection procedure as well as validity and reliability of the research design are laid out. The chapter further outlines model estimation procedure, describing how objectives of the study were achieved.

3.1 Research approach

This study is a post positivist philosophical oriented deductive quantitative approach, that is scientific and comprises the use of hypotheses and research questions to observe and measure the study objectives (Creswell, 2014). The quantitative research method quantifies and analyses variables using specific statistical techniques (Apuke, 2017).

Quantitative research is preferred because it achieves high levels of data reliability due to controlled observations and minimizes subjectivity of judgement (Creswell & Creswell, 2017). It also enables the development of a theoretical framework, presented in a model, in order to conglomerate variables and examine their relationship (Fischer, Boone & Neumann, 2014). This study undertook a deductive approach, which involves verifying theories by testing hypotheses or answering questions that are derived from theory (Creswell, 2014). This type of approach to research allows for objectivity in the analysis and interpretation of data, as well as data generalizability (Creswell, 2014).

Therefore, this study addressed the following:

a) Who was assessed? – Females across South Africa.

b) What was assessed? - Factors affecting entrepreneurial intention (EI) of females and the moderating effect of the digital environment on the impact of the factors.

c) How were they assessed? - Structured questionnaire with closed ended questions.

3.2 Research design

This cross-sectional study was based on a survey, which encompasses the use of scientific sampling methods with a designed questionnaire to measure the population's characteristics through the utilisation of statistical methods. According to Creswell (2014), a survey is a form of quantitative research that is concerned with sampling, questionnaire, design, and administration for gathering data that enables analysis of behaviour or characteristics of respondents. The survey enabled the collection of demographic data, beliefs, perceptions, attitudes, motivations, and behaviour of respondents. Surveying a part of the population enables the results to be generalised to the whole population (Apuke, 2017).

In the field of entrepreneurship, the need for surveys arise from the desire to understand complex economic and social phenomenon and could effectively fill the void that exists due to lack of a formal method of conducting systematic research in design. In addition, intensive studies enable the researcher to obtain detailed and relevant data the researcher did not anticipate finding on the onset.

3.3 Population and sampling frame

3.3.1 *Population*

The study population consisted of females across all South African provinces, including tertiary level female students studying in tertiary institutions. In quantitative research, it is important to know the size of the population understudy because such information helps the researcher to determine the appropriate sample size. However, in this study, the researcher was not able to get information about the total number of adult females across the country. Therefore, determination of appropriate sample size was inferred from literature.

3.3.2 *Sample and sampling method*

Stratified random sampling was used to select females from different provinces as the respondents may not have homogenous characteristics. This type of sampling is used when the sample to be drawn from the population does not have homogeneous characteristics. It is preferred for its ability to reduce bias and provide a sample that is representative of the population under study (Etikan & Bala, 2017). In order to conduct a clear and effective survey, prior to the research a pilot survey was carried out where 10 females were randomly selected to complete the questionnaire, and necessary alterations were made to incorporate the feedback.

Due to the quantitative nature of this study, the appropriate sample size should be selected to enable certain statistical tests to be conducted. Field (2013) points out that large sample sizes are always preferred regardless of the statistical technique employed. A sample size of at least 300 observations is recommended for factor analysis (Field, 2013). Therefore, this study targeted 300 or more responses, and the Kaiser- Meyer-Olkin (KMO) statistic, which ranges from 0 to 1 (with a value closer 1 suggesting that the sample is adequate for conducting factor analysis), was used to test for sampling adequacy in factor analysis (Field, 2009). The following table summarises the population and sample information used in this study**.**

Table 1: Research Techniques

Population	Females across South Africa
Sample	302 females
Geographic Area	South Africa
Design of Sample	Stratified
Collection Method	Online Survey

3.4 The research instrument

This study used an online self-administered questionnaire with structured closed ended questions using Qualtrics software. A research tool measuring the institutional environment of a country which was designed by Busenitz et al. (2000) was adopted for use in this study. EI questions were adapted from the EI questionnaire (EIQ) developed by Liñán and Chen (2009) and used by Shaw and Urban (2011) in their study conducted in the South African context.

The institutional profile and entrepreneurial intention scales were adapted for the purpose of this research because they have been successfully tested in South Africa. The scale for the digital environment, which is the moderator variable, was developed by the researcher, inferring from literature. Though the digital environment scale was never tested in prior studies, reliability and validity analysis indicated that the scale was reliable and consistent and thus, could be used for hypotheses testing. Control variables included age, province, ethnic group and level of education of the respondents.

All the items in the constructs were measured on a 7-point Likert scale, with a score of 1 representing strong disagreement and the highest score of 7 highlighting strongly agreement. There were no reverse coded questions in the questionnaire, hence the Likert scale was not reversed. The regulative dimension, normative dimension, cognitive dimension, and the digital

environment each consisted of 4 items per construct. The EI scale consisted of 6 items. The actual research instrument is attached in this document as Annexure B, and the table below summarises the research instrument as well as the sources from which the scales were adapted.

Table 2: Research Instrument

Items	Construct	Source
1-4	Control variables	(Shaw & Urban, 2011; Urban, 2013a)
5-8	Regulative dimension	(Busenitz et al., 2000; Urban, 2013a)
9-12	Cognitive dimension	(Busenitz et al., 2000; Urban, 2013a)
13-16	Normative dimension	(Busenitz et al., 2000; Urban, 2013a)
17-20	Digital Environment	(Caceres-Diaz, Usero-Sanchez, & Montoro-Sanchez, 2019; Dong, 2018; Steininger, 2018; Sussan & Acs, 2017; Zhang & Li, 2017)
21-26	Entrepreneurial Intention	(Liñán & Chen, 2009)

3.4.1 *Measurement of focal variables*

Dependent variable

Entrepreneurial Intention (EI) – The scale for measuring entrepreneurial intention consisted of 6 items adopted from Liñán and Chen (2009). Example questions included items like “My professional goal is becoming an entrepreneur."

Independent variables - The influence of perceptions of institutional factors were measured in line with previous studies. The respondents were asked to rate a series of statements pertaining to their perception of the institutional environment on all the three dimensions.

Regulatory dimension (RD) - Respondents were asked to note their perceptions on whether the government employs policies and initiatives that motivate and support female entrepreneurship.

Cognitive dimension (RD) – Respondents were requested to provide their views on whether knowledge on how to launch or manage a business is vital in determining entrepreneurial intention. They were assessed on their level of knowledge about entrepreneurship or where to find markets for their products.

Normative dimension (ND) - Some investigators have used specific individual characteristics, such as achievement, to determine entrepreneurial behaviour. On the other hand, other investigators have hypothesised that individuals who have greater willingness to take risks in cultures, where societal identity is based on achievement, are more entrepreneurial orientated. In this study, however, example questions included ‘female entrepreneurs are admired in this country” (Liñán & Chen, 2009), a question which interrogates support for females in society.

Moderator variable

Digital environment (DE) – The digital environment may change the way aspiring entrepreneurs perceive the institutional environment which in turn affects their EI (Caceres-Diaz et al., 2019). As such, this variable was expected to moderate the relationship between the institutional environment and EI. The respondents were asked to rate statements such as ‘The advent of the digital environment has made it easier for females to venture into entrepreneurship.’

3.5 Procedure for data collection

Primary data was collected from a target group of females in tertiary institutions across South Africa. Data collection began in August 2020 after requesting permission from the Wits University administration. The questionnaire links were sent with an introductory email to the institution, articulating the purpose of the research. After permission was granted, the University sent out the questionnaire to Wits students in the faculties of Law, Commerce, Arts, Health Sciences and Engineering. These links were also distributed via WhatsApp and Facebook networks in order to get a diverse range of respondents, including females that are not in tertiary institutions.

The survey was conducted and administered using Qualtrics software which allows for automatic transfer of survey responses to the researcher's database. For ethical considerations, consent for respondents to participate in the survey was first sought from Wits and from the participants themselves. The questionnaire was made available to the target population, through the institution, and both males and females participated though the targeted sample were females. Further, the researcher made sure that the questionnaire was compatible and easy to understand, and this was tested using a pilot survey of 10 respondents who completed the questionnaire with ease.

Online surveys have become widely used in modern day data collection due to their efficiency and effectiveness as compared to direct interviewing of participants (Sue & Ritter, 2012). This study chose online data collection because it was less costly, feasible, less time consuming and could cover a wider geographical space, thus enabling the researcher to reach out to a large number of participants.

3.6 Validity and reliability

There are different types of validity which include external, and internal or construct validity (Wetzel, 2011). Cooper and Schindler (2014) recognise that

designing a research procedure has its own problems and there are always questions about the validity of the findings. Thus, validity can be viewed as a question of whether a measure accomplishes its claim. The multi-item questionnaire was measured by different constructs for which reliability and validity were tested to minimise error.

3.6.1 ***External validity***

Taylor, Wald and Asmundson (2007) explain external validity as the ability to generalize research findings, across populations, settings, and epochs. Cooper and Schindler (2014) note that there are threats to external validity of a measure because the population from which the data is collected may not be the same as the one to which the survey results will be generalised. However, to ensure that the sample was representative and that results of this survey can be generalised, data was collected randomly. Again, the instrumented was previously tested in South Africa and was found to be valid (Shaw & Urban, 2011).

3.6.2 ***Internal validity***

Cooper and Schindler (2014) define internal validity as an assessment of whether the instrument employed actually measures what it purports to measure to the extent that results from the research are free from error and inferences can be made from them. Internal validity can be further categorized into convergent and discriminant validity (Salehi, 2012; Wetzel, 2011).

Convergent validity maintains that items that are theoretically supposed to measure the same thing should be correlated (Salehi, 2012). On the other hand, discriminant validity maintains that variables that are not supposed to measure the same thing in theory are actually not related, thus they should be unique (Wetzel, 2011). As such, inter-item correlations were used to determine convergent validity whereas the factor correlation matrix was used to ascertain discriminant validity. Inter-item correlations that are greater than 0.3 suggests that items correlate well and they are measuring the same thing (Field, 2018). However, low correlations (<0.3) imply that the constructs are unique and not measuring the same thing. Exploratory factor analysis was used to measure internal validity of the instrument.

3.6.3 ***Exploratory factor analysis***

To test for construct validity, the study used exploratory factor analysis (EFA), a method that enhances scale reliability by identifying inappropriate items that should be eliminated. This method was used by Yu and Richardson (2015), they argued that it identifies dimensionality of constructs by examining relations between items and factors when the information of the dimensionality is limited. Field (2018) points out that the use of factor analysis arises because scientific research often deals with things that cannot be directly measured that are referred to as latent variables. Latent variables may thus be measured indirectly by a number of items and factor analysis is an attempt to statistically ascertain whether the item measures a single variable or not.

Field (2013) identifies three main purposes of exploratory factor analysis; these include understanding the variable structure, designing a questionnaire in order to measure a certain variable and reducing large volumes of data into more manageable formats without losing relevant information about the data. SPSS software was used to conduct the EFA process which involves correlation analysis and selection of an appropriate method of factor extraction and factor rotation.

3.6.4 ***Reliability analysis***

Reliability concerns accuracy and precision to the research procedure and the ability of a measure to produce consistent results (Cooper & Schindler, 2014). To ensure research reliability and evidence sequence adherence, a research framework that includes objectives and procedures is key (Yin, 1994). Cronbach's alpha was used to test for reliability of the scale. It is used in assessing the internal consistency of a survey questionnaire that involves multiple Likert-type items (Cronbach, 1951). If the Cronbach's alpha is greater than 0.7, the scale is considered reliable.

3.7 Data analysis

Following a deductive approach to research, data analysis was conducted using IBM Statistical Package for Social Scientists (SPSS) software. Data collected via Qualtrics was cleaned for data integrity and then exported into SPSS software to check for missing values and test for any violations of statistical assumptions and then finally test for validity and reliability of measurement scales. The following sections outline the procedure for data analysis as conducted in this study.

3.7.1 *Missing values analysis*

Field (2013) acknowledges that primary data analysis usually faces the problem of missing data and that may arise because of incomplete questionnaires due to reasons unknown by the researcher. An online survey was conducted, and several responses came back incomplete, which led to a missing value analysis being conducted. The steps followed in the missing value analysis process adopted the 10 percent rule by Little and Rubin (1987) who contend that list wise deletion can be performed to all cases that have more than 10 percent missing observation. Thus, in this study, these cases were removed from the data set and in cases where there were less than 10 percent missing observations, the expectation maximisation method was used to replace all missing values and ensure that the whole data set was complete. Other values that were deleted from the analysis were male responses as they fell outside the targeted sample.

3.7.2 *Descriptive statistics*

Descriptive statistics were used to summarise sample characteristics and to present demographic data. A key advantage of descriptive statistics is that large amounts of data are simplified and presented in a manageable format (Apuke, 2017).

3.7.3 *Correlation Analysis*

The Pearson correlation matrix was constructed to test for linear associations between the dependent variable and independent variables and among

explanatory variables themselves. Correlation analysis is important because it enables the researcher to have a rough idea of the underlying relationships between predictor variables and the outcome variable and it is also useful in testing for multicollinearity (Field, 2013). If the absolute value of the pairwise correlation coefficient is below 0.3, then the relationship is considered weak, while correlation coefficients above 0.9 (r>0.9) imply high correlation which suggests a serious problem of multicollinearity (Gujarati, 2004). As such, before carrying out multiple linear regression analysis, it was important to first perform correlation analysis.

3.7.4 *Regression assumptions*

Field (2018) notes that it is important to check what certain statistical assumptions hold before interpreting the results to make sure that the findings are reliable for guiding policy and can be used by future researchers. Thus, in this study, the following assumptions were tested before proceeding to estimation: absence of outliers, normality of residuals, homoscedasticity, autocorrelation and no multicollinearity.

Outliers

Field (2018) describes an outlier as value that is different from the rest of the data set. The presence of outliers in a data set results in estimation bias and inflated standard errors which affect statistical inferences like hypothesis testing and confidence intervals. Outliers can be detected in several ways, chief among them being box and whisker plots, standard deviation rule and the Turkey outlier labelling rule. Box and whisker plots, also referred to as the interquartile (IQR) range rule, were used in this study because of its popularity and availability in SPSS software. In SPSS, the multiplier “k” takes two values: 1.5 (IQR) and 3 (IQR), with k=1.5 signifying “out” values and k=3 representing extreme values. The IQRs will have no labelling if there are no outliers.

Linearity

The classical multiple linear regression model assumes that the model is correctly specified as a linear function (Gujarati, 2004). The implication of this assumption is that the dependent variable should be linearly related to any independent variables and that the combined effects of predictor variables on the outcome can be found by summing their effects (Field, 2013).Violation of this assumption results in incorrect specification of the model, thus invalidating the whole model (Salvatore & Reagle, 2002).The Pearson correlation matrix was used to test for linearity in this report, whereby statistically significant correlation coefficients confirm that the model is correctly specified as a linear model.

Normality of residuals

Greene (2003) points out that in linear regression modelling, normality of the shape of distribution is of importance but researchers are normally concerned about normality of residuals. Residuals are assumed to be normally distributed. Violation of this assumption affects standard errors of regression which are used in hypothesis testing and constructing confidence intervals, thus leading to incorrect conclusions about the underlying relationships between variables (Gujarati, 2004). In this study, normality of residuals was visually assessed on SPSS using the normal probability plot (P-P), with values close to the diagonal line implying normal distribution.

Homoscedasticity

This assumption states that variance of the error term generated from the least squares model should be equal at each level of the predictor variables (Field, 2018). Violation of this assumption results in large standard errors of regression which in turn affect confidence intervals and hypothesis testing (Greene, 2003). The residual plot was used to test for homoscedasticity in this study, and there is equal variance if the scatter plot of residuals falls within the -3 to 3 range (Field, 2013).

Autocorrelation

Autocorrelation, also known as serial correlation, is a problem that is common in time series data where observations might follow a natural ordering over time (Salvatore & Reagle, 2002). It becomes a problem in cross-sectional data if errors are correlated for any two observations (Field, 2018). The Durbin-Watson (DW) test was used to detect autocorrelation. The DW has critical values that range from 0 to 4, with a value close to 2 suggesting that there is no autocorrelation and a value greater than 3 and less than 1 implying that there is autocorrelation (Greene, 2003).

Multicollinearity

Multicollinearity measures the degree of linear associations among predictor variables in a model. In this study, the Pearson correlation matrix was used for testing. Multicollinearity is a serious problem in linear regression if the absolute value of the pairwise correlation coefficient is greater than 0.9 (Field, 2018) Using highly correlated independent variables in the same regression model results in indeterminate or invalid parameter estimates (Gujarati, 2004). A possible solution to the problem of multicollinearity is to drop one of the highly correlated variables guided by theory.

3.7.5 *Hierarchical multiple linear regression*

Hierarchical multiple linear regression was utilised for hypotheses testing in this study. It is a form of multiple linear regression which involves sequential entering of additional variables into the model with the aim of finding out how explanatory power of the model changes as more predictor variables are added Field (2018). Thus, it is employed to determine whether one or a set of explanatory variables significantly predicts the outcome while controlling for other variables in the model.

Hierarchical regression was performed using the SPSS linear regression command, and variables were added in blocks, beginning with control variables and institutional factors were added one after the other to determine the change in explanatory power of the model (Field, 2018). Control variables which were categorical in nature were entered into the regression model as dummy variables

after dummy coding. The R-squared measures the percentage of variation of the dependent variable that is explained by the combined variations in independent variables. In hierarchical regression, if the R-squared increases after adding a predictor variable, it suggests that the variable is useful to the model since it improves explanatory power of the model. Since the main objective of this study was to investigate the influence of institutional variables on entrepreneurial intention in the digital environment, modelling linear regression alone would not be sufficient, hence moderation analysis was conducted.

Based on the constructs described in section **3.4.1**, the following linear regression model was estimated.

$$EI_i = \alpha + \partial_1 Age_i + \partial_2 Ethnic_i + \partial_3 Edu_i + \partial_4 Prov_i + \beta_1 RD_i + \beta_2 CD_i + \beta_3 ND_i + \varepsilon_i \ldots\ldots\ldots\ldots\ldots 1,$$

where α is the constant term, ∂_s are dummy variable coefficients , and control variables (age, ethnic group, education level, province), βs are coefficients of independent variables, subscript *i represents an individual element of the sample (cross sectional data) and* ε_i *is the residual term.*

3.7.6 ***Moderation analysis***

Apart from estimating the direct relationship between an outcome variable and a predictor variable, analysis may involve estimating the combined effect of two or more independent variables on the dependent (Field, 2013). This combined effect is called moderation or the interaction effect. A moderator variable stands between, or moderates, the impact of the independent variable on the dependent variable (Creswell, 2014). Thus, the main idea behind moderation analysis is to find out how the relationship between the outcome and predictor variable changes as a result of another variable. In this study, the digital environment enters the model as the moderator variable and the variable was multiplied by each institutional dimension to compute the interaction terms.

To analyse the moderation effect of the digital environment on the factors affecting EI, three steps were followed:

1. The original equation was estimated without the interaction term.
2. The moderator variable was introduced by multiplying each independent variable with the moderator variable. Field (2018) emphasises that for the interaction term to be valid, both the predictor and moderator variable should be included.
3. In the final step, the change in the coefficient of determination (R-squared) was assessed. A significant change implies that the moderator variable is relevant in moderating the influence of the independent variables on the dependent. Therefore, in this report, it was determined how the strength or direction of the relationship between EI and each of the institutional dimensions is affected by the digital environment. If the R-squared changes and is significant, then there is moderation, and the reverse is true if it does not change. Changes in slopes of the predictor variables were also assessed to determine the impact of the moderator variable.

Based on the outlined procedure, moderation analysis was performed by estimating the following three equations:

$$EI_i = \alpha + \beta_1 RD_i + \beta_2 DE_i + \gamma RDDE_i + \varepsilon_i \ldots\ldots\ldots\ldots\ldots 2,$$

where RDDE is the interaction term and γ is the coefficient of the interaction term. Equation 2 tests the interaction between the regulatory dimension and the digital environment.

$$EI_i = \alpha + \beta_1 CD_i + \beta_2 DE_i + \gamma CDDE_i + \varepsilon_i \ldots\ldots\ldots\ldots\ldots 3$$

Equation 3 tests the interaction between the digital environment and the cognitive dimension (CDDE)

$$EI_i = \alpha + \beta_1 ND_i + \beta_2 DE_i + \gamma NDDE_i + \varepsilon_i \ldots\ldots\ldots\ldots\ldots 4$$

Equation 4 tests the interaction between the normative dimension and the digital environment (NDDE).

3.8 Limitations of the study

Despite building from a strong theoretical and empirical ground, this study has its own limitations which are outlined in this section:

- The study results may not be generalised to males since the focus was on females.
- Krueger et al. (2000) argues that intentions are formed overtime, thus necessitating longitudinal analysis. However, this study is limited in this respect because it is cross sectional in nature, thus only covering a point in time, while making it difficult to infer causality
- Limited time was also a significant constraint towards a more in-depth study.

3.9 Ethical considerations

Ethical procedures for research exist to ensure dignity and avoidance of financial or emotional harm to respondents. Since this study involved human participants it was important to protect the rights of the participants and to make sure that the data collection process does no harm or result in loss of privacy (Cooper & Schindler, 2014).

In order to ensure that ethical practices are adhered to, the researcher explained, in the form of an introductory letter, the benefits of the study, and the guarantee that the participants' privacy and rights would be respected. Moreover, before collecting data, the researcher sought consent from the participants who were then informed about the objectives of the research and consideration of their right to anonymity. Thus, to get permission to collect data from different tertiary institutions, an introductory was obtained from the University administration.

3.10 Conclusion

This chapter outlined the methodology followed in achieving the research objectives. The focus was on building a research model from theory as well as empirical studies. The research instrument used in this study was adopted from

previous studies that have successfully tested it in the South African context and other emerging countries. Sampling framework was discussed in line with procedure for data analysis and ethical considerations in primary research. Having outlined the research procedure, chapter four of this study presents the results of the model estimated.

CHAPTER 4. PRESENTATION OF RESULTS

This chapter presents, analyses, and interprets results of the study as outlined in chapter 3. Sample characteristics are presented in the first section, followed by reliability and validity of measurement scales (the Cronbach's Alpha and exploratory factor analysis). The final section presents hierarchical multiple regression analysis as well as diagnostic tests for assumptions of multiple linear regression.

4.1 Sample characteristics and demographic profiles of respondents

A total of 602 responses were received from the online survey. Though the target sample was females, male respondents participated in the survey. 235 male respondents were eliminated from the sample, leaving a total of 367 female respondents. Of the 367 females, 65 responses were eliminated from the sample as they had more than 10 percent missing values (Little & Rubin, 1987). Thus, the sample size of 302 females after screening and deletion of missing data was used. The following tables now present descriptive statistics for the control variables used in this study.

Table 3: Age

AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-29	225	74.5	74.5	74.5
	30-39	57	18.9	18.9	93.4
	40-49	14	4.6	4.6	98.0
	50-59	5	1.7	1.7	99.7
	60 and above	1	0.3	0.3	100.0
	Total	302	100.0	100.0	

Table 3 shows that majority of the respondents (74.5 percent) were between 18 to 29 years, followed by 30 to 39 years (18.9 percent), 40 to 49 years (4.6 percent), 50 to 59 years (1.7 percent) and 60 years and above (0.3 percent)

Table 4: Ethnic group

Ethnic group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black	199	65.9	65.9	65.9
	White	57	18.9	18.9	84.8
	Indian	17	5.6	5.6	90.4
	Colored	18	6.0	6.0	96.4
	Asian	6	2.0	2.0	98.3
	Others	5	1.7	1.7	100.0
	Total	302	100.0	100.0	

From table 4, black people were the dominant ethnic group constituting of 65.9 percent of the sample. White people made up 18.9 percent, followed by Coloured people (6 percent), Indians (5.6 percent), Asians (2 percent), while 1.7 percent of the sample population did not specify their ethnic group**.**

Table 5: Education level

EDU					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1st year	44	14.6	14.6	14.6
	2nd year	47	15.6	15.6	30.1
	3rd year	48	15.9	15.9	46.0
	4th year	38	12.6	12.6	58.6
	Masters	74	24.5	24.5	83.1
	Postgraduate diploma	31	10.3	10.3	93.4
	PHD	20	6.6	6.6	100.0
	Total	302	100.0	100.0	

Table 5 indicates that a large fraction of the sample was enrolled for a master's degree (24.5 percent) followed by those in their third year of study (15.9 percent). Females in second-year of study made up 15.6 percent, followed by first years' (14.6 percent) and fourth years' (12.6 percent). Only 10.3 percent of the females were undertaking their postgraduate diplomas, while 6.6 percent were studying for doctorate degrees.

Table 6: Province

Province					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gauteng	244	80.8	80.8	80.8
	Eastern Cape	8	2.6	2.6	83.4
	Mpumalanga	13	4.3	4.3	87.7
	Western Cape	9	3.0	3.0	90.7
	Limpopo	19	6.3	6.3	97.0
	Kwazulu-Natal	9	3.0	3.0	100.0
	Total	302	100.0	100.0	

Results in table 6 show that more than three quarters of the respondents were from Gauteng province (80.8 percent), 6.3 percent were from Limpopo province, 4.3 percent were based in Mpumalanga, 2.6 percent were from Eastern Cape, while KwaZulu Natal and Western Cape only had 3 percent each. The valid responses were slightly over the targeted sample of 300, which is a good size for factor analysis and multiple linear regression analysis (Comrey & Lee, 2013).

4.2 Reliability of measurement scale

There were five constructs with independent variables including regulatory dimension (RD), the cognitive dimension (CD), normative dimension (ND) and moderator variable, and the digital environment (DE). Entrepreneurial intention (EI) was the dependent variable consisting of 6 items. All independent variables and the moderator variable consisted of 4 items each, all measured on a 7-point Likert scale.

Cronbach's alpha was used to test for construct reliability, with an alpha greater than 0.7 suggesting that the scale is internally consistent. An alpha for each construct was estimated, and results indicate that for all 5 scales, the value of the alpha exceeds 0.7, implying that the measurement scale was reliable in all cases. Results of reliability analysis are summarised in table 7.

Table 7: Summary of reliability analysis

Construct	Code	No.of items	α(before adjustment)	Items deleted	α(after adjustment)
Entrepreneurial intention	EI	6	0.934	None	0.934
Regulative dimension	RD	4	0.849	None	0.849
Cognitive dimension	CD	4	0.784	None	0.782
Normative dimension	ND	4	0.739	None	0.740
Digital environment	DE	3	0.710	1	0.727

Cronbach's alpha before and after adjustment was also assessed to find out if deleting an item would improve the reliability of the scale. The two alphas should be very close to each other to confirm the reliability of the scale. As shown in table 7, there is not much difference between the alphas, except for the digital environment. One item from the digital environment construct was dropped, and the overall alpha improved from 0.712 to 0.727. Inter item correlation were also assessed to ascertain the convergence and discriminant validity. The following section presents inter item correlations for each construct.

4.2.1 *Entrepreneurial intention*

Table 7 shows that the overall alpha for the EI construct is highly reliable (α=0.934) and there was no change in the alpha if item was deleted. Table 8 provides inter-item correlations for the EI construct.

Table 8: Inter-item correlations (Entrepreneurial Intention)

EI	EI01	EI02	EI03	EI04	EI05	EI06
EI01	1					
EI02	.635	1				
EI03	.645	.794	1			
EI04	.590	.729	.787	1		
EI05	.527	.737	.768	.756	1	
EI06	.532	.670	.735	.818	.816	1

Table 8 shows that all the inter-item correlations are greater than 0.3, implying that items in the scale correlate highly with each other and they are all measuring the same thing, thus there is evidence of convergent validity.

4.2.2 *Regulative dimension*

The overall Cronbach's alpha for the regulative dimension scale as provided in table 7 is 0.849 which is the same as the alpha before adjustment. All 4 items were retained; thus, the scale was deemed internally consistent. Table 9 provides inter-item correlations.

Table 9: Inter-item correlations (Regulative dimension)

RD	RD01	RD02	RD03	RD04
RD01	1			
RD02	.698	1		
RD03	.534	.543	1	
RD04	.588	.618	.521	1

Inter-item correlations in table 9 are all greater than 0.3, confirming that the items are measuring the same construct, thus there is convergent validity.

4.2.3 *Cognitive dimension*

As shown in table 7, the overall alpha for the cognitive dimension is greater than 0.7 and there is a slight difference between the alpha before adjustment and after

adjustment. However, inter-item total statistics show that there was no improvement in the overall alpha if any of the items were deleted. Therefore, no item was deleted, and the measurement scale was deemed reliable. Inter-item correlations for the items in the construct are presented in the table below.

Table 10: Inter-item correlations (Cognitive dimension)

CD	CD01	CD02	CD03	CD04
CD01	1			
CD02	.488	1		
CD03	.450	.412	1	
CD04	.400	.331	.777	1

All inter-item correlations are greater than 0.3, suggesting convergent validity.

4.2.4 *Normative dimension*

Table 7 shows that the scale for the normative dimension was good (α= 0.740) and all items were retained since deleting an item would not lead to improvement in the overall alpha. The following table provides results for inter-item correlations for this particular construct.

Table 11: Inter-item correlations (Normative Dimension)

ND	ND01	ND02	ND03	ND04
ND01	1			
ND02	.514	1		
ND03	.505	.419	1	
ND04	.371	.311	.399	1

Inter-item correlations shown in table 11 show that all correlations are above 0.3 suggesting convergent validity.

4.2.5 *Digital environment*

The digital environment had a good reliability scale (α= 0.710). However, the item-total statistics indicated that deleting one item with a low inter-item correlation would improve the alpha (α= 0.727), it was therefore deleted. The following table presents inter- item correlations and item total statistics for the digital environment.

Table 12: Item total statistics (Digital environment)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DE1	15.39	10.558	.355	.168	.727
DE2	15.46	7.824	.655	.598	.537
DE3	15.71	8.080	.598	.582	.578
DE4	14.70	11.002	.400	.183	.700

Table 13: Inter-item correlations (Digital environment)

DE	DE01	DE02	DE03	DE04
DE01	1			
DE02	.291	1		
DE03	.225	.761	1	
DE04	.364	.311	0.282	1

Table 13 shows that DE01 had low correlations with DE02 and DE03, and table 12 shows that improvement in the scale of DE01 was deleted. Therefore, it was necessary to delete the item from the scale. Further reliability analysis indicated that the alpha would have improved to 0.802 if the DE04 was deleted, however, deleting it would have left the scale with less than 3 items, thus violating the ‘at least three items per construct’ rule (Stevens, 2002). As such, DE4 was retained, leaving the scale with only three items. After deleting DE01, all inter- item correlations were greater than 0.3, except for one item. However, this is

acceptable, and the scale was thus deemed reliable and there was evidence of convergent validity.

4.2.6 *Summary of reliability analysis*

For all the constructs, the Cronbach's alpha was greater than 0.7 and the inter-item correlation coefficients were greater than 0.3, except for the digital environment. The Cronbach's alpha if item is deleted indicated that in all constructs with the exception of DE, there was no need to delete any item since there was not any case where the alpha improved if an item was deleted, thus the constructs were consistent and highly reliable and there was evidence of convergent validity (A. Field, 2018). Having assessed the internal consistency of the measurement scale, the following section presents construct validity analysis.

4.3 Exploratory Factor Analysis (EFA)

Exploratory factor analysis from IBBM SPSS version 25 statistical package was used to test for validity of the scale of measurement. However, before proceeding to carryout factor analysis, it was important to make sure that the sample size was adequate and suitable for EFA (Field, 2018). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was employed for this analysis. If the KMO statistic is above the 0.5 cut-off, it suggests that the sample size is suitable for factor analysis. From the remaining 21, after reliability analysis, the principal axis factoring (PAF) was used to extract the number of factors that are expected to be correlated. The decision on the number of factors to extract was reached by utilising the Scree plot and Kaiser's criterion of eigenvalues whereby only factors with eigenvalue of above one are extracted (Field, 2018). Characteristic variables that have the highest factor loadings on the most important factor and relatively small loading on other factors makes interpretation difficult, hence the need to carry out factor rotation which discriminates between factors (Stevens, 2002).

In this study, the oblique rotation with Promax was used to rotate the factors, thus allowing them to correlate with each other. A cut-off of 0.3 was used to decide which factors to retain or exclude. Factors with loadings above 0.3 were retained, and this is acceptable in this study since the sample size is greater than 300

(Stevens, 2002). In order to determine the percentage of variation explained by each factor, this study used the pattern matrix, and the total variance is explained.

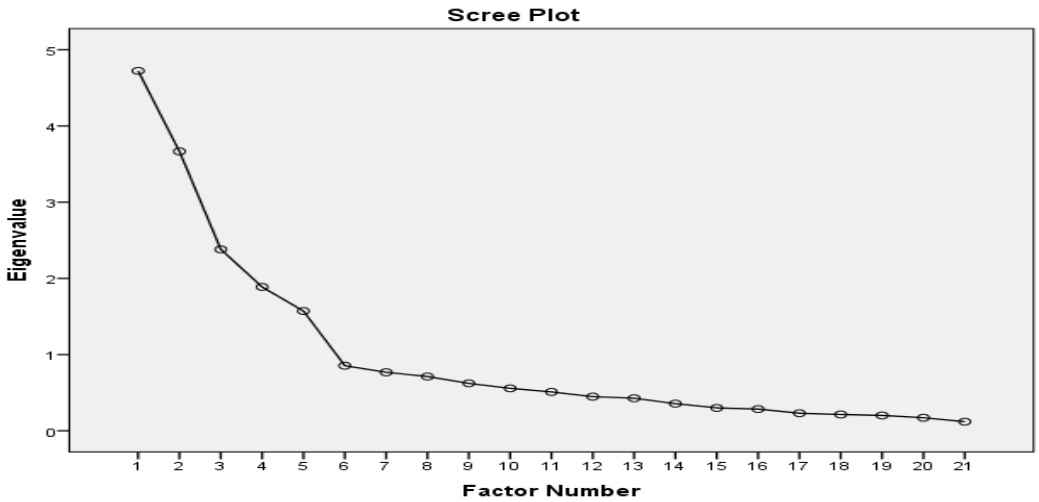
The following table shows results of the sampling adequacy criteria.

Table 14: KMO test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.794
Bartlett's Test of Sphericity	Approx. Chi-Square	3327.394
	Df	210
	Sig.	.000

The KMO statistic (0.794) is above the 0.5 cut-off, and is statistically significant, suggesting that EFA can be conducted. The following figure shows the plot of eigenvalues for the extracted factors.

Figure 4: Scree plot



The plot of eigenvalues indicated that 5 factors were above 1 and were therefore extracted. The following table shows the total variance explained.

Table 15: Total variance explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.723	22.489	22.489	4.438	21.134	21.134	4.382
2	3.666	17.457	39.946	3.242	15.437	36.571	2.632
3	2.380	11.335	51.281	1.965	9.356	45.927	2.368
4	1.887	8.987	60.268	1.448	6.896	52.823	2.213
5	1.571	7.482	67.750	1.260	6.002	58.825	2.042
6	.854	4.069	71.818				
7	.768	3.655	75.474				
8	.712	3.389	78.863				
9	.622	2.964	81.827				
10	.557	2.651	84.478				
11	.510	2.426	86.905				
12	.448	2.133	89.037				
13	.427	2.033	91.070				
14	.356	1.694	92.765				
15	.300	1.430	94.195				
16	.284	1.354	95.549				
17	.230	1.095	96.644				
18	.214	1.017	97.661				
19	.201	.957	98.618				
20	.171	.815	99.433				
21	.119	.567	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 15 shows that the 5 extracted factors explained at least 67.75 percent of the total variations in the data set.

The following table gives results of the pattern matrix, showing extracted factors and respective factor loadings for each item in the scale.

Table 16: Pattern matrix

Pattern Matrix[a]					
	Factor				
	1	2	3	4	5
RD01		.820			
RD02		.836			
RD03		.662			
RD04		.753			
CD01			.503		
CD02			.435		
CD03			.918		
CD04			.847		
ND01				.801	
ND02				.629	
ND03				.650	
ND04				.522	
DE02					.870
DE03					.878
DE04					.314
EI01	.676				
EI02	.851				
EI03	.914				
EI04	.879				
EI05	.871				
EI06	.852				
Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.					
a. Rotation converged in 5 iterations.					

Table 16 shows that 5 factors were extracted through principal axis factoring (PFA) and all items except DE04, had a factor loading of greater than 0.4 implying that each item explained more than 16 percent of the variance, thus the factors loading were significant at 1 percent level (p= 0.01). The item which had a factor loading of 0.314 was still considered acceptable since there were more than 300 observations understudy. The variables were therefore considered important for further analysis.

4.3.1 *Summary of validity and reliability analysis*

This section summarises Cronbach's alpha and EFA results and assesses convergent and discriminant validity of the constructs understudy. Cronbach's alpha results showed that the measurement scale for all the constructs was internally consistent and reliable. There was further evidence of convergent validity from inter-item correlations, since all inter-item correlations for each construct were greater than 0.3 EFA was conducted to further confirm the validity of the constructs and 5 factors were extracted.

The EFA results showed that some items were loading highly on their respective factors whereas some were having low factor loading on other factors, implying that there was evidence of discriminant validity. The factor correlation matrix was constructed to further confirm discriminant validity.

Table 17: Factor correlation matrix

	EI	CD	ND	RD	DE
E1	1				
CD	.170	1			
ND	.131	.220	1		
RD	.058	.063	.003	1	
DE	.120	.276	.281	.022	1

For discriminant validity to be confirmed, factor correlation coefficients are expected to be low (<0.3), though they can correlate. As such, table 17 shows that all the correlation coefficients are less than 0.3, suggesting that the factors were unique and not measuring the same dimension. It was concluded that there was both convergent and discriminant validity in the measurement scale and the constructs were good for further analysis. The following sections now present descriptive statistics of the constructs as well as hypotheses testing.

4.4 Descriptive statistics

Having conducted reliability and validity analysis, this section presents descriptive statistics for all the quantitative variables, which are entrepreneurial

intention (dependent variable) and normative dimension, cognitive dimension, regulative dimension and digital environment (independent variables).

Table 18: Descriptive statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EI	302	5.105	.974	-.385	.140	-.245	.280
CD	302	4.298	1.119	-.483	.140	.537	.280
ND	302	5.203	1.101	-.782	.140	.498	.280
RD	302	4.745	1.646	-.410	.140	-.689	.280
DE	302	3.671	1.155	-.075	.140	-.021	.280

Table 20 is based on the 7-point Likert scale with the following: 1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=neutral, 5=somewhat agree, 6=agree, 7=strongly agree

Descriptive statistics in table 18 show that there were 302 observations in each construct. On average, respondents somewhat agreed with the normative dimension scale (mean = 5.2) and the entrepreneurial intention scale (mean = 5.10). Respondents were, on average, neutral about the cognitive dimension scale (mean = 4.3) and the regulative dimension scale (mean = 4.7). However, respondents somewhat disagreed with the digital environment scale (mean = 3.7).

Skewness and Kurtosis measure the distribution of the data set. Table 18 shows that the skewness and kurtosis statistics are all in the range of -2 to 2, which implies that all variables approximate normal distribution of the data set. Items in each construct were combined into a single scale by computing an average score for each construct. Having presented the descriptive statistics of the underlying variables, the following section presents correlation analysis.

4.5 Correlation analysis

After presenting descriptive statistics, correlation analysis was conducted to determine the strength and direction of the relationships among variables under

study. This was important as it helps the researcher to test for linearity of the model as well as multicollinearity. Correlation analysis was performed using the Pearson correlation matrix, and the coefficients range from -1 to 1, with absolute 1 implying perfect collinearity. Negative coefficients imply negative relationships between constructs and values below 0.3 suggest weak correlation. Table 19 presents results of correlation analysis among the constructs used in this report.

Table 19: Pearson correlation matrix

	EI	CD	ND	RD	DE
E1	1				
CD	.170**	1			
ND	.131*	.220**	1		
RD	.058	.063	.003	1	
DE	.120*	.276**	.281**	.022	1

**Correlation is significant at the 0.05 level (2-tailed).*

***Correlation is significant at the 0.01 level (2-tailed).*

Results from correlation analysis indicate that all variables are positively correlated. There is a significant positive correlation between the dependent variable, entrepreneurial intention, the cognitive dimension (r= 0.170; p< 0.01), normative dimension (r= 0.131; p< 0.05) and the digital environment (r= 0.12; p< 0.05). The correlation between EI and RD was positive but insignificant. However, the correlations are rather weak (<0.3).

4.6 Regression analysis

This section presents results of hierarchical multiple regression performed using SPSS version 25. Regression assumptions are tested first before presenting the final regression results to make sure that no assumption was violated.

4.6.1 *Regression assumptions*

Outliers

All constructs were tested for outliers using box and whisker plots. The results indicate that the variables EI, RD, CD and ND had some outliers whereas DE had

no outliers. Following the test, the outliers were removed and details of the test are provided in the appendix section.

Linearity and Multicollinearity test

The Pearson correlation matrix in table 19, performed on all the constructs in the model, indicates that there are some significant correlations among the variables implying that the model was correctly specified as a linear model. Multicollinearity was tested on all independent variables using the pairwise correction matrix presented in the following table.

Table 20: Correlation matrix

	RD	CD	ND	DE
RD	1			
CD	.063	1		
ND	.003	.220	1	
DE	.022	.276	.281	1

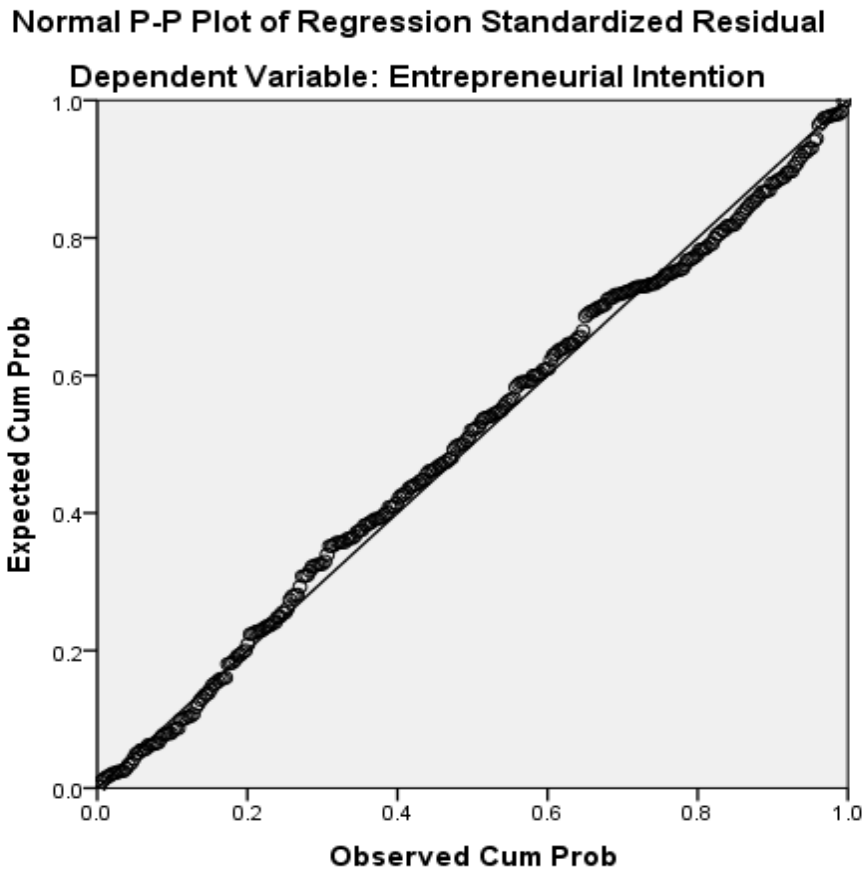
The table shows that there was no serious problem of multicollinearity since all the absolute values of the pairwise correlation coefficients are less than 0.8.

Post estimation diagnostic tests

Normality of residuals

The error terms were tested for normality using the P-P plots.

Figure 5: Plot of Residuals



The plot of residuals is close to the diagonal line, implying that the errors are normally distributed.

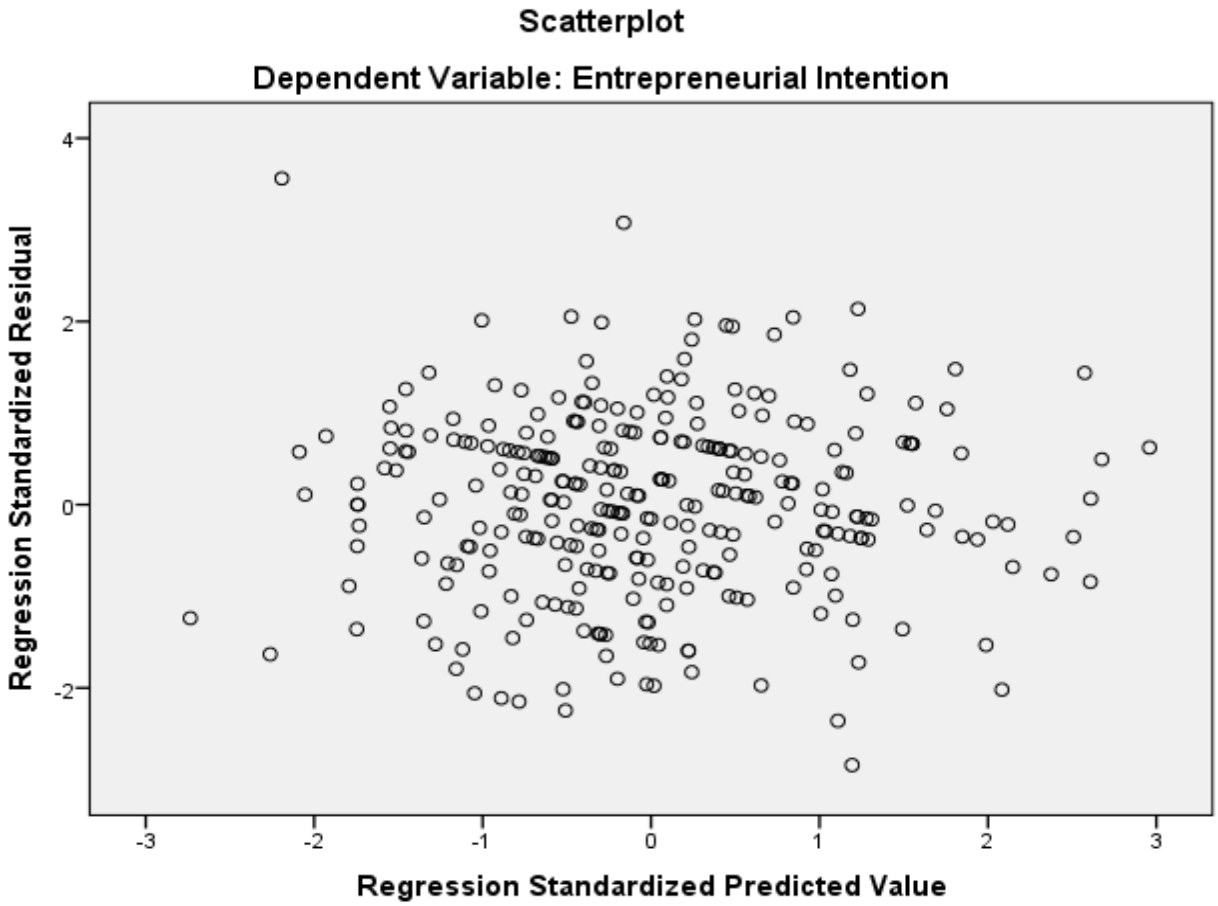
Autocorrelation

The DW statistic (2.169) is close to 2, suggesting that errors are independent of each other, thus there is no autocorrelation (Gujarati, 2004).

Homoscedasticity

Residual scatter plot was used to test for equal variance and results of the scatter plot presented in Figure 5 show that the plot of residuals fall within the -3 to 3 range which suggests that the variance of the error terms is constant (Field, 2018)

Figure 6: Homoscedasticity test



4.6.2 *Hierarchical multiple Linear regression results*

The estimated model passed all the necessary diagnostic tests; thus, no assumption was violated. The following table presents regression results for the influence of the institutional factors on entrepreneurial intention.

Table 21: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.260[a]	.068	.055	1.123	.068	5.399	4	297	.000	
2	.260[b]	.068	.052	1.124	.000	.016	1	296	.898	
3	.314[c]	.099	.081	1.107	.031	10.156	1	295	.002	
4	.334[d]	.112	.090	1.101	.013	4.197	1	294	.041	2.169

a. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29
b. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29, RD
c. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29, RD, CD
d. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29, RD, CD, ND
Dependent Variable: EI

Table 21 presents a summary of hierarchical regression modelling whereby four control variables were first entered in the model. The regulative dimension was entered in the second model, followed by the cognitive dimension in the third model and finally the normative dimension was entered in the fourth model. Change in R-squared was used to assess the contribution of each predictor variable as it was added to the model.

The first model shows that the control variables accounted for about 6.8 percent of the variations in entrepreneurial intention. There was no change in R-squared as a result of adding the regulative dimension into the second model, suggesting that the variable was insignificant in explaining entrepreneurial intention. In the third model, adding the cognitive dimension significantly improved the model's predictive capacity to 9.9 percent. Lastly, in the fourth model, adding the normative dimension resulted in an increase in R-squared by 0.013 percent, and the overall predictive power of the model was 11.2 percent. Thus, about 11.2% of the variations in entrepreneurial intention are explained by the combined variations in all the predictor variables in the model.

Therefore, it can be concluded that although the explanatory power of the model was poor it is acceptable in cross-sectional analysis (Gujarati, 2004). The Adjusted R-squared (0.09) is very close to the R-squared which suggest that the latter is reliable, thus the model was of good fit. The following table provides Analysis of Variance (ANOVA) table for all the four models and shows that models 1, 2, 3 and 4 were all valid at 5 percent level of significance ($p<0.05$).

Table 22: ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.237	4	6.809	5.399	.000[b]
	Residual	374.583	297	1.261		
	Total	401.820	301			
2	Regression	27.258	5	5.452	4.308	.001[c]
	Residual	374.562	296	1.265		
	Total	401.820	301			
3	Regression	39.724	6	6.621	5.394	.000[d]
	Residual	362.096	295	1.227		
	Total	401.820	301			
4	Regression	44.820	7	6.403	5.273	.000[e]
	Residual	356.999	294	1.214		
	Total	401.820	301			

a. Dependent Variable: Entrepreneurial Intention
b. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29
c. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29, RD
d. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29, RD, CD
e. Predictors: (Constant), Gauteng, postgrad, black, years_18_to_29, RD, CD, ND

Table 23 provides regression coefficients for all four models, and the final model is interpreted in the following sections.

Table 23: Regression coefficients

Model		Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.894	.266		14.618	.000	3.370	4.419
	years_18_to_29	-.260	.156	-.098	-1.668	.096	-.568	.047
	Black	.377	.140	.155	2.687	.008	.101	.654
	Postgrad	-.421	.179	-.137	-2.350	.019	-.774	-.068
	Gauteng	.090	.168	.031	.534	.594	-.241	.421
2	(Constant)	3.866	.349		11.084	.000	3.179	4.552
	years_18_to_29	-.258	.158	-.098	-1.638	.103	-.568	.052
	Black	.375	.142	.154	2.643	.009	.096	.654
	Postgrad	-.420	.180	-.136	-2.334	.020	-.774	-.066
	Gauteng	.093	.170	.032	.546	.586	-.242	.428
	RD	.005	.041	.007	.128	.898	-.075	.086
3	(Constant)	3.108	.418		7.440	.000	2.286	3.930
	years_18_to_29	-.270	.155	-.102	-1.741	.083	-.576	.035
	Black	.367	.140	.151	2.627	.009	.092	.642
	Postgrad	-.428	.177	-.139	-2.415	.016	-.777	-.079
	Gauteng	.050	.168	.017	.295	.768	-.282	.381
	RD	.011	.040	.016	.278	.781	-.068	.090
	CD	.183	.057	.177	3.187	.002	.070	.296
4	(Constant)	2.637	.475		5.552	.000	1.702	3.571
	years_18_to_29	-.290	.155	-.110	-1.874	.062	-.594	.015
	Black	.377	.139	.155	2.709	.007*	.103	.650
	Postgrad	-.432	.176	-.140	-2.448	.015*	-.778	-.085
	Gauteng	.019	.168	.007	.114	.909	-.312	.350
	RD	.007	.040	.011	.185	.853	-.071	.086
	CD	.157	.058	.152	2.692	.008*	.042	.272
	ND	.122	.060	.116	2.049	.041*	.005	.239

a. Dependent Variable: EI, **p<0.05,*

Results from hierarchical multiple linear regression model 4 show that the standardised coefficients of the cognitive dimension (β= 15.2%) and the normative dimension (β= 11.6%) are all statistically significant at 5 percent level (p< 0.05). This implies that the constructs are significant contributors in explaining EI. A detailed discussion of the results is presented in the following section. Control variables were entered into the model to control the effect of age,

education level, ethnic group and province on female entrepreneurial intentions and this inclusion improved the overall predictive power of the model.

Ethnic group and education level were significant control variables, and results show that the mean entrepreneurial intention for blacks is 0.377 units higher than that of other ethnic groups. It was also revealed that the average entrepreneurial intention of postgraduate females is 0.432 units lower than that of undergraduate level females.

4.6.3 *Moderation analysis*

This study hypothesised that the digital environment moderates the influence of the institutional dimensions on EI. Therefore, this section presents the results of moderation analysis building on the procedure outlined in section 3.6.7 of this study. A two-step hierarchical regression analysis was performed to determine the change in R-squared as a result of adding the interaction term. Each independent variable was analysed separately as follows:

Table 24: Regression results of regulative dimension with the digital environment as moderator.

	Base model			With moderator		
	B	SE	β	B	SE	B
Constant	4.733	.233		5.332	.573	
RD	.096	.048	.117*	-.066	.150	-.081
DE	.010	.033	.017	-.115	.114	-.203
RD*DE				.034	.029	.311
R-squared	.018			.021		
∆ in R-square	.003					
F-base	.071					
F-moderator	.305					

**p<0.05, RD-Regulative dimension, DE-Digital environment, RD*DE-interaction term*

Table 24 shows that the regulative dimension significantly predicts entrepreneurial intention in the base model since the standardised coefficient (β= 0.117) had a p- value of 0.044 which is less than 0.05. The table shows that the base model explains about 1.8 percent of the variations in EI whereas the model with the moderator explains about 2.1 percent. Thus, there was a 0.3 percent

increase in explanatory power of the model after adding the interaction term, however, the change in R-square was insignificant (p= 0.305> 0.05). The coefficient of the interaction term is statistically insignificant. Therefore, it can be concluded that there is no evidence to support that the digital environment moderates the relationship between the regulative dimension and EI.

Table 25: Cognitive dimension and EI with digital environment as moderator

	Base model			With moderator		
	B	SE	β	B	SE	B
Constant	2.534	.387		2.340	1.246	
CD	.153	.061	.148*	.198	.282	.192
DE	.094	.070	.079	.134	.256	.113
CD*DE				-.009	.056	-.063
R-squared	.035			.035		
∆ in R-square	.000					
F-base	.005					
F-moderator	.870					

**p<0.05, CD-Cognitive dimension, DE-Digital environment, CD*DE-interaction term*

Results in table 25 indicate that the base model explains about 3.5 percent of the variation in EI and there was no change in R-square after adding the interaction term to the model. The p-value of the F-statistic for the model with the moderator shows that the change in R-squared is statistically insignificant at 5 percent level, p= 0.870 >0.05 confirming that there was no moderation. The following table presents results of the normative dimension with digital environment as the moderator.

Table 26: Normative dimension and EI with moderation

	Base model			With moderator		
	B	SE	B	B	SE	B
Constant	2.580	.411		5.297	1.461	
ND	.109	.063	.104	-.428	.284	-.408
DE	.103	.072	.087	-.459	.299	-.387
ND*DE				.109	.057	.809
R-squared	.024			.036		
∆ in R-square	.012					
F-base	.026					
F-moderator	.054					

*ND-Normative dimension, DE-Digital environment, ND*DE-interaction term*

Results for the moderation analysis of the normative dimension and digital environment are presented in table 26. Results show that the change in the R-square after introducing the moderator variable was 1.2 percent; this was insignificant as confirmed by the probability value of the F-statistic (0.054), as it is statistically insignificant at 5 percent level. Thus, it can be concluded that there was no moderation in this particular case.

4.7 Results and hypotheses

Hypothesis 1: Favourable perceptions of the regulative dimension have a positive influence on female entrepreneurial intentions

Regression results in model 4 show that the p-value (0.853) of the standardised coefficient of the regulative dimension (18.5%) is greater than the 5 percent significance level which means that there was no effect of the regulative dimension on EI. Thus, hypothesis 1 was not supported as the accumulated evidence clearly shows that perceptions of the regulatory dimension have no influence on female entrepreneurial intention in South Africa.

Hypothesis 2: Favourable perceptions of the cognitive dimension have a positive influence on female entrepreneurial intentions

The standardised coefficient of the cognitive dimension (15.2%) was found to be positive and statistically significant at 5 percent level ($p<0.05$). This implies that an increase by 1 percent in the perceptions about the cognitive dimension results in a 15.2 % increase in EI of females, holding all other factors constant. Therefore, hypothesis 2 was supported, and it can be concluded that favourable perceptions of the cognitive dimension can certainly be associated with higher entrepreneurial intentions among females.

Hypothesis 3: Favourable perceptions of the normative dimension have a positive influence on female entrepreneurial intentions

Regression results show that the normative dimension has a positive coefficient of 0.112 which is statistically significant at 5 percent level ($p<0.05$). The result suggests that an increase in favourable perceptions of the normative dimension by 1 % results in an increase in EI by 11.2% units, holding other factors constant.

Thus, hypothesis 3 was supported and it can be concluded that the normative dimension positively influences female EIs in South Africa.

Hypothesis 4a: Perceptions of the digital environment moderates the influence of the regulative dimension on female EI.

The moderation analysis conducted shows that the addition of the interaction between the digital environment and regulative dimension could not significantly improve the explanatory power of the model and the interaction term itself was found to be statistically insignificant. Therefore, results failed to support hypothesis 4a, concluding that the digital environment does not moderate the influence of the regulative dimension on EI.

Hypothesis 4b: Perceptions of the digital environment moderates the influence of the cognitive dimension on female EI.

The two step regression analysis performed to test this hypothesis shows that adding the moderator variable to the model could not significantly change the R-squared of the model. Thus, there was no evidence found to support hypothesis 4b, this indicates that the influence of the cognitive dimension on EI is not moderated by the digital environment.

Hypothesis 4c: Perceptions of the digital environment moderates the influence of the normative dimension on female EI.

Results of moderation analysis presented in table 26 show that there was no evidence to support hypothesis 4c since there was no significant change in R-squared after introducing the moderator variable to the model. As such, it can be concluded that the digital environment does not moderate the influence of the normative dimension on female entrepreneurial intentions.

4.8 Chapter summary

The first section of this chapter presented sample characteristics and descriptive statistics of demographics. The final sample size used in this study consisted of 302 females across South Africa, and the data collected was subjected to cleaning and analysis using IBM SPSS version 25. The procedure for data

analysis began with checking data for missing values before proceeding to conducting descriptive statistics and factor analysis. Since the constructs used in this study involved latent variables, it was necessary to conduct validity and reliability analysis before proceeding to hypotheses testing. Exploratory factor analysis was also conducted to extract items that belong to the same factor and Cronbach's alpha was used to ascertain internal consistency of the measurement scale. Five factors were extracted and a regression model with 5 variables (one dependent and 4 independent variables) was constructed. From the factor analysis, correlation analysis was performed to determine the direction and strengths of relationships among constructs.

The chapter proceeded to conduct hierarchical multiple linear regression, with control variables (age, ethnic group, province and ethnic group) added first, followed by each independent variable. Regression analysis concluded with moderation analysis where the influence of interactions between the independent constructs and the moderator variable was investigated. The following table presents a summary of the results of hypotheses tested in this study as well as the results of the influence of control variables on EI.

Table 27: Summary of hypotheses

Hypothesis	Beta (β)	t or F value	p-value	Result
H1	.071	1.282	.201	Not supported
H2	.152	2.692	.008	Supported
H3	.116	2.049	.041	Supported
H4a	-	1.054	.305	Not supported
H4b	-	.027	.870	Not Supported
H4c	-	.012	.054	Not supported

In conclusion, this chapter presented results of the methodology outlined in chapter 3. Data analysis was conducted, and hypotheses were tested. Results revealed that the normative and cognitive dimensions of South Africa's institutional profile have a positive influence on entrepreneurial intentions of females. The regulative dimension was found to have no influence on EI and there was no evidence to support the hypothesis that the digital environment

moderates the influence of institutional dimensions on EI. These findings are discussed in detail in Chapter five in line with theoretical and empirical literature.

CHAPTER 5. DISCUSSION OF RESULTS

5.1 Introduction

This chapter focusses on the discussion of results; it relates these findings to the theoretical and empirical literature presented in chapter 2 of this report. From the discussions, conclusions pertaining to the hypotheses formulated in this study will be drawn.

5.2 Discussion pertaining to the hypotheses

The objective of this study was to analyse the factors that influence EI of females in the digital ecosystem. Hypotheses were formulated in line with the accumulated literature and were tested as presented in chapter 4. This section therefore discusses the findings from the tests conducted and relates the results to the literature.

5.2.1 *Regulative dimension and EI*

This study hypothesised that favourable perceptions of the regulative dimension have a positive influence on EI. The regression results revealed that the relationship between the regulative dimension and EI was positive but insignificant. The result is thus contrary to the expectation of this study which postulated that a favourable regulatory environment offers increased opportunities for starting new business ventures. Such findings also contradict prior studies which claimed that favourable perceptions of the regulatory environment are associated with higher entrepreneurial intentions (Kujinga, 2016; Urban, 2013a).

Farashah (2015) provided cross-country evidence on the effect of institutional factors on EI, concluding that countries that have strong regulatory institutions and government support have higher levels of EI as compared to those with weaker regulatory institutions. This is also supported by Herrington and Kew

(2018) who found that government support for entrepreneurial activities encourages aspiring entrepreneurs to take risk in starting new businesses. However, a contradicting result was discovered by Valdez and Richardson (2013) who found that the regulatory dimension was actually negatively related to entrepreneurial activity, concluding that there was a negative association of the regulatory environment and opportunities to start a business.

Using a range of statistical techniques to evaluate quantitative data, the results of this study corresponded with the findings of Shaw and Urban (2011) who found a positive but insignificant influence of the regulative environment on EI. This result can be attributed to inadequate government support for female entrepreneurial activities, but potential entrepreneurs do not consider it as convincing enough to encourage new venture creation. In essence, this implies that government should intervene heavily in providing institutional support to females and create an enabling environment that is favourable for business growth.

5.2.2 *Cognitive dimension and EI*

Results of this study show that favourable perceptions of the cognitive dimension had a positive and significant influence on female entrepreneurial intentions, thus, hypothesis 2 was supported. Empirical literature provides evidence that individual cognitive aspects are associated with higher entrepreneurial intentions (Farashah, 2015). This is supported by Garcia-Cabrera et al. (2018) who notes that knowledge and skills are key determinants of entrepreneurial intention. There is also wide evidence which suggests education, skills, training and experience positively affect EI in developing countries (Farashah, 2015; Urban, 2013a; van der Westhuizen & Goyayi, 2020; Westhead & Solesvik, 2016).

Literature has also linked the cognitive institutional dimension with self-efficacy, pointing out that self-efficacy is an important antecedent to entrepreneurial intention, and it can be greatly influenced by access to information and wide use of ICT services (van der Westhuizen & Goyayi, 2020). In support of this, Huarng et al. (2012) stated that education level, business experience and expertise as well as strong managerial skills greatly influence EI.

Taking the results into consideration; this then calls for strong government support in facilitating acquisition of knowledge and skills among potential female entrepreneurs. As mentioned previously, GEM reports highlight that South Africa still lags behind in promoting business skills, enhancing access to business information and supporting an entrepreneurial culture (Herrington & Kew, 2018), as a result, a lack of skills is prevalent among women (Meyer and Mostert 2016).

This study's finding regarding hypothesis 2 is however contrary to other studies conducted in South Africa on the same subject (Shaw & Urban, 2011; Urban, 2013a). Shaw and Urban (2011) and Urban (2013a) found that the cognitive dimension had a negative influence on EI attributing the result to lack of skills, business knowledge and resources as major impediments to starting a new business in South Africa.

5.2.3 *Normative dimension and EI*

This study hypothesised that favourable perceptions of the normative dimension are associated with higher entrepreneurial intentions. This hypothesis was supported as results indicate that there was a positive and highly significant relationship between ND and EI. The result conforms to the findings of Urban (2013a) as it mentioned that positive perceptions of the normative institutional dimension instil a sense of belief among potential female entrepreneurs that they can be successful entrepreneurs if they become risk-takers.

This is also supported by Krueger et al. (2000) who found that acceptance of entrepreneurial behaviour by society has a positive influence on EI. These authors also note that the decision of who will or will not become an entrepreneur is greatly influenced by people's beliefs and expectations.

Literature has also explored the role of culture, beliefs and norms in entrepreneurial activity, pointing out that female entrepreneurs are often not appreciated, and they are largely subjected to negative attitudes towards their efforts (Kamberidou, 2020; Vossenberg, 2016). These negative perceptions towards females in business have discouraged aspiring female entrepreneurs to venture into business start-ups (Chinomona and Maziriri 2015). Thus, in line with the findings of this study, perceptions of the normative dimension play a key role

in shaping female entrepreneurial intentions, and social support for females is key in encouraging business start-ups in South Africa.

5.2.4 *Digital environment and institutional dimensions on EI*

Hypothesis 4 of this study concerns the indirect effects of the institutional dimensions on entrepreneurial intention. It was hypothesised that the influence of the institutional dimensions on EI is moderated by the digital environment. Prior studies acknowledge the role of the digital environment in creating a conducive institutional environment that facilitates easy flow of business operations (Dong, 2018).

A study by Steininger (2018) revealed that information systems and technologies have acted as mediators of entrepreneurial activity. Dong (2018) contends that the hurdles associated with a country's regulatory framework might be overcome by advancements in the digital ecosystem which in turn encourages entrepreneurial activity. Further, Arbache (2018) linked the digital ecosystem with the cognitive dimensions, pointing out that the advent of the digital ecosystem has facilitated increased access to information, thus making business operations easier.

In this study, it was expected that the influence of the regulative dimension, the normative dimension and cognitive dimension on EI would be moderated by the digital environment. Results however indicate that there was no moderation in all three cases, leading to the failure to support hypothesis 4a, 4b and 4c. The interaction terms were all positive but statistically insignificant. This result can be attributed to the measurement scale of the digital environment construct which had some limitations in terms of low inter item correlations and factor loadings. However, there is a possibility that the insignificant coefficients might have been a result of the sample size used, and perhaps targeting a large sample size would improve the results.

5.3 Conclusion

The objective of this chapter was to discuss the results of the estimation presented in chapter 4. This study expected favourable perceptions of the institutional dimensions of a country's institutional profile to have a positive influence on female entrepreneurial intentions. It was also hypothesised that favourable perceptions of the digital environment moderate the influence of the institutional dimensions on EI.

The discussion in this chapter revealed that female EI in South Africa is positively influenced by perceptions of the cognitive and normative dimension, but the regulatory dimension was found to have no influence on EI as there was no evidence to support any moderating effect of the digital environment. It was also revealed that the findings of this study conform to literature and there were also contradictory results which are probably a result of the differences in methodological frameworks employed and sample characteristics. Having discussed the study findings, the next chapter concludes the study by providing policy recommendations to government as well as suggesting areas for further study.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATONS

6.1 Introduction

This chapter focuses on drawing conclusions based on the findings of this study. The first section presents an overview of the study, highlighting key findings as well as summarising the whole study. This is followed by recommendations to policy makers and academics based on the findings. The chapter concludes by suggesting areas for further research.

6.2 Conclusions of the study

The main objective of this study was to analyse factors that influence entrepreneurial intentions of South African females within the digital environmental context. Thus, analysis was focussed on institutional factors and how they interact with the digital environment to influence the intention of females to start their own businesses. Utilising cross sectional data collected from females across South Africa, this study employed hierarchical multiple linear regression analysis to test the hypotheses of the study.

There is evidence in literature that EIs are influenced by the institutional environment (Busenitz et al., 2000; Urban, 2013a). Further, the fast-growing digital ecosystem has enabled easy flow of business operations, with some encouraging women to take advantage of it in breaking the barriers they face in trying to become successful entrepreneurs (Dahlman et al., 2016; Kamberidou, 2020).

Despite availability of evidence linking institutions and entrepreneurship, female entrepreneurship remains an under researched area, and literature that integrates institutional theory with the digital ecosystem is scarce (Albashrawi & Alashoor, 2017; Chinomona & Maziriri, 2015). As such, this study was motivated by the need to encourage women to venture into entrepreneurship in an institutional environment that supports their endeavours, and encourages them

to take advantage of the digital technology in order to overcome prevalent challenges.

Empirical evidence from this study revealed that female entrepreneurial intentions in South Africa are positively influenced by perceptions of the normative and cognitive institutional dimensions. In essence, this means that women in South Africa believe that increased institutional support in terms of access to education, skill development and valuing and respecting women in business would increase their chances of becoming entrepreneurs. This is important considering that promoting female entrepreneurship has become one of the major goals of developing countries (Vossenberg, 2016), recognising the impact that entrepreneurship has on job creation and social development.

The findings of this study are consistent with institutional theory of entrepreneurship which posits that institutional factors have direct and indirect effects on entrepreneurial intention (Engel et al., 2009). The results are also in line with prior studies (Engle et al. 2009; Farashah, 2015; Shahid et al. 2018; Urban, 2013).

Further, in this study it was also revealed that perceptions of the regulative institutional dimension have a positive but insignificant influence on female EIs. It was expected that females perception on the role of government in supporting entrepreneurship would have a positive influence on the decision to start a business venture. However, empirical evidence could not support it but the result is consistent with Shaw and Urban (2011) who concluded the same in the South African context. There was also no evidence to support the claim that the digital ecosystem interacts well with institutional factors to encourage females to venture into entrepreneurship. However, literature suggests that the digital ecosystem may enable entrepreneurs to overcome barriers that come with the institutional environment (Dong, 2018; Zhang & Li, 2017).

6.3 Recommendations

Entrepreneurship is undoubtedly a key driver of economic growth and development and in line with the SDGs, and achieving gender equality requires

greater institutional support for women to bring them into the mainstream economy. Decisions on whether to start a business or not are based on a number of factors, some of which were analysed in this study. As such, building from this analysis, it is important for policy makers to understand how the institutional environment shapes female entrepreneurial intentions in South Africa. The finding that intentions are influenced by the normative and cognitive dimension in South Africa draws a number of recommendations which are presented as follows:

- Perceptions of the cognitive dimension encompass aspects such as education, management skills and access to information. Thus, in line with the result of this study, it is recommended that government should implement policies that promote entrepreneurial skills thereby exposing women to entrepreneurship. A poor education system has been identified as one of the major reasons for low entrepreneurial intention in South Africa (Herrington & Kew, 2018). Therefore, in the spirit of economic development, introducing entrepreneurial courses across all study disciplines could increase entrepreneurial intentions of women as confirmed by previous research (Skosana, 2012).

- The role of culture, values, beliefs and norms in entrepreneurship cannot be underestimated. This study confirmed that all these aspects of the normative dimension have a positive influence on female EIs. The GEM reports note that in South Africa, the entrepreneurial culture is weak and associated with negative perceptions towards entrepreneurship (Herrington & Kew, 2018). Thus, policy makers should focus on enhancing entrepreneurial intentions of women through implementation of policies that encourage entrepreneurship. This should translate to society embracing female entrepreneurs and seeing them as role models, thereby positively influencing attitudes of other aspiring female entrepreneurs. By promoting a culture that values female entrepreneurship, entrepreneurial intentions of women are increased.

- A supportive regulatory environment is also key in positively influencing female EIs. As such, government should increase support for female entrepreneurs in terms of funding, training, education as well as facilitating ease of doing business.

- There is also need for women to be encouraged to take advantage of the growth in digital technology and make use of it in advancing their entrepreneurial goals. This would assist in reducing the gender gap as more women would be able to participate in the entrepreneurial ecosystem.

6.4 Suggestions for further research

This study had some limitations in trying to achieve the objectives and future research should take some of these limitations into account. It has been argued that intentions are formed overtime (Krueger et al., 2000), thus, considering this argument, this study was limited in that it analysed intentions at a point in time. Future studies could focus on analysing the factors that affect EI of women over time. A longitudinal analysis that also takes into account the role of the environment could provide a more convincing analysis.

Further, regression analysis results revealed that the explanatory power of the estimated model was low (11.2%), implying that 89.8% of female EI are explained by other factors that were not included in the model. This suggests that more exploratory studies on the determinants of EI among females still need to be carried out. Future research could focus on analysing other determinants that are not only institutional in nature.

This study only focused on the formation of EIs among females, making it difficult to generalise the findings to males across South Africa. Though reports indicate that males are more likely to venture into entrepreneurship in South Africa than females (Herrington & Kew, 2018), the role of gender in the formation of EIs is still an area for further research. Thus, future studies could analyse how gender affects individual cognitive processes that might lead to lower EI among females.

Again, the theory of planned behaviour points out to a number of factors that affect entrepreneurial intention such as perceived behavioural control, attitude towards behaviour and subjective norms which were not included in this study. Self-efficacy has also been found to play a key role in shaping EIs. As such, future research could consider integrating the TBP and self-efficacy with the institutional environment in order to understand their effect on EIs. It is also important to investigate whether perceived self-efficacy influences the relationship between the institutional factors and EIs.

Lastly, simple linear regression analysis, which has some limitations, was employed for analysis in this study. Future research could re-evaluate this topic, utilising other estimation techniques like structural equation modelling which enables the assessment of the overall power of the model and simultaneous estimation of direct and indirect relationships among constructs.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Albashrawi, M., & Alashoor, T. M. (2017). The role of IT on entrepreneurial intention: The effect of general computer self-efficacy and computer anxiety.

Apuke, O. D. (2017). Quantitative research methods: A synopsis approach. *Arabian Journal of Business and Management Review, 6*(10), 40-47.

Arbache, J. (2018). Seizing the benefits of the digital economy for development. *International Center of Trade and Sustainable Development*.

Autio, E., Keeley, R. H., Klofsten, M., Parker, G. C., & Hay, M. (2001). Entrepreneurial intent among students in Scandanavia and in the USA. *Enterprise and Innovation Management Studies, 2*(2), 145-160.

Baumol, W. J. (1990). Entrepreneurship: Productive, Unproductive and Destructive. *Journal of Political Economy, 98* (5), 893–921.

BBBEC. (2017). *Strategy of the Broad-Based Black Economic Empowerment Commission.* Retrieved Online: http://bbbeecommission.co.za/wp-content/uploads/2016/03/BBBEE-Strategic-Plan.pdf

Bird, B. (1988). Implementing entrepreneurial ideas: The case for intention. *The Academy of Management Review, 13*(3), 442-453.

Bosma, N., Wennekers, S., & Amorós, J. E. (2011). *Global Entrepreneurship Monitor: 2011 Extended Report. Entrepreneurs and Entrepreneurial Employees across the Globe*. Retrieved Online: https://www.gemconsortium.org/file/open?fileId=48326

Bozkurt. (2000). *Entrepreneurship*.

Busenitz, L. W., Gomez, C., & Spencer, J. W. (2000). Country Institutional Profiles: Unlocking Entrepreneurial Phenomena. *Academy of Management Journal, 43*(5), 994–1003.

Caceres-Diaz, P., Usero-Sanchez, M. B., & Montoro-Sanchez, A. (2019). *Digital Infrastructure and Entrepreneurship: The Digital Era's Enabling Effect.* Paper presented at the 30th European Conference of the International Telecommunications Society (ITS): "Towards a Connected and Automated Society", Helsinki, Finland, 16th-19th June, 2019, International Telecommunications Society (ITS), Calgary.

Chinomona, E., & Maziriri, E. T. (2015). Women in action: Challenges facing women entrepreneurs in the Gauteng Province of South Africa. *International Business & Economics Research Journal (IBER), 14*(6), 835-850.

Comrey, A. L., & Lee, H. B. (2013). *A First Course in Factor Analysis*: Psychology press.

Cooper, D. R., & Schindler, P. S. (2014). *Business Research Methods*: McGraw-Hill Companies.

Creswell, J. W. (2014). Research Design - Qualitative, Quantitative and Mixed Method Approaches. In *Research Design - Qualitative, Quantitative and Mixed Method Approaches* (pp. 36). Los Angeles Sage Publications Inc.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches.*: Sage publications.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. . *psychometrika, 16*(3), 297-334.

Dahlman, C., Mealy, S., & Wermelinger, M. (2016). Harnessing the digital economy for developing countries.

Davidsson, P. (1995). Determinants of entrepreneurial intentions.

Dennis Jr, W. J. (2011). Entrepreneurship, small business and public policy levers *Journal of Small Business Management, 49*(1), 92-106.

Díaz-Casero, J. C., Ferreira, J. J. M., Mogollón, R. H., & Raposo, M. L. B. (2012). Influence of institutional environment on entrepreneurial intention: a comparative study of two countries university students. *International Entrepreneurship and Management Journal, 8*(1), 55-74.

Dong, J. Q. (2018). Moving a mountain with a teaspoon: Toward a theory of digital entrepreneurship in the regulatory environment. *Technological Forecasting and Social Change, 146*, 923-930.

DTI. (2012). *Employment opportunities for women and people with disabilities*. Retrieved from Online

Dutot, V., & Van Horne, C. (2015). Digital entrepreneurship intention in a developed vs. emerging country: An exploratory study in France and the UAE. . *Transnational Corporations Review, 7*(1), 79-96.

Eckhardt, J. T., & Shane, S. A. (2003). Opportunities and entrepreneurship. *Journal of management, 29*(3), 333-349.

Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change, 150*, 119791.

Engle, R. L., Schlaegel, C., & Dimitriadi, N. (2009). *Institutions and entrepreneurial intent: A case for Herzberg?* Paper presented at the Proceedings of the Academy of International Business Southeast Conference.

Estrin, S., & Mickiewicz, T. (2009). Do institutions have a greater effect on female entrepreneurs?

Etikan, I., & Bala, K. (2017). Sampling and Sampling Methods. *Biometrics and Biostatistics International Journal., 5*(6), 01-49.

Farashah, A. D. (2015). The effects of demographic, cognitive and institutional factors on development of entrepreneurial intention: Toward a socio-cognitive model of entrepreneurial career. *Journal of International Entrepreneurship, 13*(4), 452-476.

Fatoki, O. O. (2010). Graduate Entrepreneurial Intention in South Africa: Motivations and Obstacles. *International Journal of Business and Management, 5*(9), 87.

Field, A. (2009). *Discovering statistics using SPSS*: Sage publishers.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4 ed.): Sage publishers.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5 ed.): Sage publishers.

Fischer, H. E., Boone, W. J., & Neumann, K. (2014). Quantitative Research Designs and Approaches. *Leibniz-Institute for Science and Mathematics Education*.

Fonseca, L. M. (2018). *Industry 4.0 and the digital society: concepts, dimensions and envisioned benefits.* Paper presented at the Proceedings of the international conference on business excellence.

Garcia-Cabrera, A. M., Garcia-Soto, M. G., & Dias -Furtado, J. (2018). The individual's perception of institutional environments and entrepreneurial motivation in developing economies: Evidence from Cape Verde. *South African Journal of Economic and Management Sciences, 21*, 1-18.

GEDI. (2017). *The Entreprenurial Ecosystem of South Africa* Retrieved from South Africa.

Giones, F., & Brem, A. (2017). Digital technology entrepreneurship: A definition and research agenda. *Technology Innovation Management Review, 7*(5).

Gore, A., & Fal, M. (2019). *The entrepreneurial dialogues: State of entrepreneurship in South Africa.* University of Pretoria.

Greene, W. H. (2003). *Econometric analysis*: Pearson Education India.

Gujarati, D. (2004). *Basic Econometrics* Magraw Hill Inc.

Herrington, M., & Kew, P. (2018). *Is there a change of attitude towards the small and medium business sector in South Africa? A Global Entrepreneurship Monitor perspective*. Retrieved from Western Cape:

Huarng, K.-H., Mas-Tur, A., & Yu, T. H.-K. (2012). Factors affecting the success of women entrepreneurs. *International Entrepreneurship and Management Journal, 8*(4), 487-497.

Hytti, U. (2010). Contextualizing entrepreneurship in the boundary less career. *An International Journal. Gender in Management*, 78-99.

Kamberidou, I. (2020). “Distinguished” women entrepreneurs in the digital economy and the multitasking whirlpool. *Journal of Innovation and Entrepreneurship, 9*(1), 3.

Kazumi, T., & Kawai, N. (2017). Institutional support and women’s entrepreneurial self-efficacy. *Asia Pacific Journal of Innovation and Entrepreneurship, 11* (3), 345-365.

Kostova, T. (1997). *Country institutional profiles: Concept and measurement.* Paper presented at the Academy of management proceedings.

Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of business venturing, 15*(5-6), 411-432.

Kujinga, K. L. (2016). The influence of institutional environmental factors on social entrepreneurial intentions among tertiary-level students in South Africa (Doctoral dissertation).

Li, J., Westbrook, J., Callen, J., & Georgiou, A. (2012). The role of ICT in supporting disruptive innovation: a multi-site qualitative study of nurse practitioners in emergency departments. *BMC Medical Informatics and Decision Making, 12*(1), 27.

Li, W., Du, W., & Yin, J. (2017). Digital entrepreneurship ecosystem as a new form of organizing: The case of Zhongguancun *Frontiers of Business Research in China, 11*(5).

Liñán, F., & Chen, Y. W. (2009). Development and cross–cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice, 33*(3), 593-617.

Little, R. J., & Rubin, D. (1987). *Statistical analysis with missing data* (Vol. 793): John Wiley & Sons.

Malebana, M. J. (2015). Gender Differences in Entreprenurial Intention in the rural provinces of South Africa *Journal of Contemporary Management, 12*.

Malik, P. (2017). Gendering Digital Entrepreneurship: From Research to Practice Using a Tensional Lens. Doctoral dissertation. In: Purdue University.

Mandipaka, F. (2014). An investigation of the challenges faced by women entrepreneurs in developing countries: A case of King Williams' Town, South Africa. *Mediterranean Journal of Social Sciences*, 127-130.

Matiwane, M. (2005). South African Women entrepreneurship: A burgeoning force in our economy. A special report for SAWEN, an initiative of the DTI group.

Meyer, N., & Mostert, C. (2016). Perceived barriers and success factors of female entrepreneurs enrolled in an entrepreneurial programme. *International Journal of Social Sciences and Humanity Studies, 8*(1), 48-65.

Moon, J., Hossain, M. D., Kang, H. G., & Shin, J. (2012). An analysis of agricultural informatization in Korea: the government's role in bridging the digital gap. *Information Development, 28*(2), 102-116.

Nabi, G., Linan, F., Iakovleva, T., Kolvereid, L., & Stephan, U. (2011). Entrepreneurial intentions in developing and developed countries. *Education and Training, 53*(5), 353-370.

Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship Theory and Practice, 41*(6), 1029-1055.

National Treasury. (2020). *National Budget Review*. Retrieved from

Naushad, M., Faridi, M. R., & Malik, S. A. (2018). Economic development of community by entrepreneurship: an investigation of the entrepreneurial intent and the institutional support to the local community in Al-Kharj region.

Nguyen, C. (2018). Demographic factors, family background and prior self-employment on entrepreneurial intention-Vietnamese business students are different: why? *Journal of Global Entrepreneurship Research, 8*(1), 10.

North, D. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

Okeke-Uzodike, O. E., Okeke-Uzodike, U., & Ndinda, C. (2018). Women entrepreneurship in Kwazulu-Natal: a critical review of government intervention politics and programs. *Journal of International Women's Studies*(19(5)), 147-164.

Reitan, B. (1996). *Entrepreneurial intentions: a combined models approach*. Paper presented at the 9th Nordic Small business research conference, Lillehammer, Norway.

Salehi, M. (2012). The Construct Validity of a Test: A Triangulation of Approaches. *Language Testing in Asia, 2*(2), 102-118.

Salvatore, D., & Reagle, D. (2002). *Schaum's outline of theory and problems of statistics and econometrics*. New York: McGraw-Hill.

Schumpeter, J. A., & Redvers, O. P. I. E. (1934). Theorie der wirtschaftlichen Entwicklung [The theory of economic development: An inquiry into profits, capital, interest, and the business cycle].

Scott, R. W. (1995). *Institutions and Organizations. Ideas, Interests and Identities*: Sage publishers.

SDGfund. (2020). *Sustainable Development Goals: Gender Equality.*

Shahid, M. S., Imran, Y., & Shehryar, H. (2018). Determinants of entrepreneurial intentions: An institutional embeddedness perspective. *Journal of Small Business & Entrepreneurship, 30*(2), 139-156.

Shaw, G., & Urban, B. (2011). *The influence of the institutional environment on entrepreneurial intentions in an emerging economy.* Paper presented at the ICSB World Conference Washington.

Sivarajah, K., & Achchuthan, S. (2013). Entrepreneurial Intention among Undergraduates: Review of Literature. *European Journal of Business and Management, 5*(5), 172-186.

Skosana, B. V. (2012). *A study of entrepreneurial intentions of students at FET colleges in South Africa* University of the Witwatersrand.

Spencer, J. W., & Gómez, C. (2004). The relationship among national institutional structures, economic factors, and domestic entrepreneurial activity: a multi-country study. *Journal of Business Research, 57*(10), 1098-1107.

Steininger, D. M. (2018). Linking information systems and entrepreneurship: A review and agenda for IT-associated and digital entrepreneurship research. *Information Systems Journal, 29*(2), 363-407.

Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4 ed.). Hillsdale, New Jersey: Erlbaum.

Sue, V. M., & Ritter, L. A. (2012). *Conducting online surveys* Thousand Oaks, California: Sage publishers.

Sussan, F., & Acs, Z. J. (2017). The digital entrepreneurial ecosystem. *Small Business Economics, 49*(1), 55-73.

Swartz, E., Marks, J. T., & Scheepers, C. (2020). Venture Support Organizations – Lighting a Path for Entrepreneurship in South Africa? *Entrepreneurship Research Journal, 10*(2), 20200060. doi:https://doi.org/10.1515/erj-2020-0060

Taylor, S., Wald, J., & Asmundson, G. J. (2007). Factors associated with occupational impairment in people seeking treatment for posttraumatic

stress disorder. *Canadian Journal of Community Mental Health, 25*(2), 289-301.

Urban. (2008). Social entrepreneurship in South Africa: Delineating the construct with associated skills. *International Journal of Entrepreneurial Behaviour and Research, 14*(5), 346-364.

Urban. (2013a). Social entrepreneurship in an emerging economy: A focus on the institutional environment and SESE. . *Managing Global Transitions: An International Research Journal, 11*(4), 3-25.

Urban. (2013b). Social entrepreneurship in an emerging economy: a focus on the institutional environment and SESE. Managing Global Transitions. *An International Research Journal, 11(4)*, 3-25.

Urban. (2013c). Social entrepreneurship in an emerging economy: A focus on the institutional environment and social entrepreneurial self-efficacy. *Managing Global Transitions: International Research Journal, 11*(1).

Valdez, M. E., & Richardson, J. (2013). Institutional determinants of macro–level entrepreneurship. *Entrepreneurship Theory and Practice, 37*(5), 1149-1175.

van der Westhuizen, T., & Goyayi, M. J. (2020). The influence of technology on entrepreneurial self-efficacy development for online business start-up in developing nations. *The International Journal of Entrepreneurship and Innovation, 21*(3), 168-177.

von Briel, F., Davidsson, P., & Recker, J. (2018). Digital technologies as external enablers of new venture creation in the IT hardware sector. *Entrepreneurship Theory and Practice, 42*(1), 47-69.

Vossenberg, S. (2016). Gender-aware women's entrepreneurship development for inclusive development in sub-Saharan Africa. INCLUDE knowledge platform on inclusive development policies.

Welter, F., & Kolb, S. (2006). Women and entrepreneurship in Latvia. *Telia Sonera Institute Discussion Paper, 4*.

Westhead, P., & Solesvik, M. Z. (2016). Entrepreneurship education and entrepreneurial intention: Do female students benefit? *International Small Business Journal, 34*(8), 979-1003.

Wetzel, A. (2011). *Factor Analysis Methods and Validity Evidence: A Systematic Review of Instrument Development across the Continuum of Medical Education.* (Master of Education), Virginia Commonwealth University,

Yin, R. K. (1994). Discovering the future of the case study. Method in evaluation research. Evaluation practice. *15*(3), 283-290.

Yousafzai, S. Y., Saeed, S., & Muffatto, M. (2015). Institutional theory and contextual embeddedness of women's entrepreneurial leadership: Evidence from 92 countries. *Journal of Small Business Management, 53*(3), 587-604.

Yu, T., & Richardson, J. C. (2015). An exploratory factor analysis and reliability analysis of the student online learning readiness (SOLR) instrument. *Online Learning, 19*(5), 120-141.

Zhang, F., & Li, D. (2017). Regional ICT access and entrepreneurship: Evidence from China. *Information & Management, 55*(2), 188-198.

APPENDIX A: Research Instrument

Title：Factors influencing female entrepreneurial intentions in the South African digital ecosystem

Survey Flow

Standard: Block 1 (1 Question)
Block: Default Question Block (1 Question)
Standard: Block 7 (1 Question)
Standard: Please answer the following demographic questions (4 Questions)
Standard: Your Perception of the Regulatory Institution (4 Questions)
Standard: Your Perception of the Cognitive Dimension (4 Questions)
Standard: Your Perception of the Normative Dimension (4 Questions)
Standard: Your Perception of the Digital Environment (4 Questions)
Standard: Your Entrepreneurial Intention (6 Questions)

Start of Block: Block 1

Q0 Dear Participant, Digital technologies are disrupting business trends, in the way we communicate, consume products and services. These disruptions necessitate a change in behavior by all players in the economy. My name is Nombulelo Danisa and I am conducting research on the factors influencing entrepreneurial intentions of females in the South African digital ecosystem. The entrepreneurial space is characterised by a wide gender gap with female entrepreneurs lagging. The digital economy promises ease of business and many opportunities which without a strong societal, regulatory, or knowledge support, might see the gender gap widen This survey requires completion by female participants. and should take no more than 10 - 15 minutes to complete.

Kind regards

End of Block: Block 1

Start of Block: Default Question Block

Q1

STATEMENT BY PERSON AGREEING TO PARTICIPATE IN THIS STUDY I agree to participate in this research on the factors affecting female entrepreneurial intentions in the South African digital ecosystem. I understand that I am participating based on my own will and that this is research project will not benefit me personally but may contribute to literature and society. I understand that my participation will remain confidential. I freely and voluntarily choose to participate in this study.

- ○ Yes (1)
- ○ No (2)

Q2 Please state your gender

- ○ Male (11)
- ○ Female (12)
- ○ Other (13)

End of Block: Block 7

Start of Block: Please answer the following demographic questions

Q3 How old are you ?

- 18 - 29 (1)
- 30 - 39 (2)
- 40 - 49 (3)
- 50 - 59 (4)
- 60 and above (5)

Q4 Please specify your ethnicity?

- Asian (1)
- Black (2)
- Coloured (3)
- Indian (4)
- White (5)
- Other (6)

Q5 What year of study are you enrolled for ?

- ○ 1st Year (1)
- ○ 2nd Year (2)
- ○ 3rd Year (3)
- ○ 4th Year (4)
- ○ Postgraduate Diploma (5)
- ○ Masters (6)
- ○ PHD (7)

Q6 Which Province do you live in?

- ○ Eastern Cape (1)
- ○ Free State (2)
- ○ Gauteng (3)
- ○ KwaZulu Natal (4)
- ○ Limpopo (5)
- ○ Mpumalanga (6)
- ○ North West (7)
- ○ Northern Cape (8)
- ○ Western Cape (9)

Start of Block: Your Perception of the Regulatory Institution

Q7 Government assists females in starting their own business.

- ○ Strongly Agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q8 Government sets aside contracts for new and small businesses owned by females.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q9 Even after failing, government assists entrepreneurs to start a business again

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q10 Government sponsors organizations that help new female owned businesses develop.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Start of Block: Your Perception of the Cognitive Dimension

Q11 Females know where to find markets for their products

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Q12 Females find it easy to access information on how to start a business

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Q13 Females who start new businesses know how to deal with risk

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Q14 Females who start new businesses know how to manage risk

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Start of Block: Your Perception of the Normative Dimension

Q15 Turning new ideas into businesses is admired in South Africa

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Q16 Innovative, creative thinking is viewed as a route to success

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q17 Female entrepreneurs are admired in this country

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Q18 Females in South Africa greatly admire other females who start their own businesses

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Start of Block: Your Perception of the Digital Environment

Q19 The advent of the digital environment has made it easier for females to venture into entrepreneurship

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q20 Digital knowledge is easily accessible

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q21 Digital tools are easily accessible

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q22 Using my mobile and social media enables me easy access to markets.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Start of Block: Your Entrepreneurial Intention

Q23 I am ready to do anything to be an entrepreneur.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q24 My professional goal is becoming an entrepreneur

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q25 I will make every effort to start and run my own business.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q26 I'm determined to create a business in the future

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q27 I have very seriously thought of starting a business.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q28 I have an intention to start a business some day.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

APPENDIX B: Consistency Matrix

Title : Factors influencing entrepreneurial intentions of women in the South African digital ecosystem							
Main Objective : To investigate factors that influence women's entrepreneurial intentions in the South African digital ecosystem							
Sub-Aims/Objectives	**Literature Review**	**Hypotheses /Propositions**	**Research questions**	**Variables(Independent, Moderator & Dependent)**	**Source of data**	**Type of data**	**Analysis**
To investigate the influence of the regulatory dimension on female entrepreneurial intention	Shaw and Urban(2011), Urban (2013), Farashah (2015)	**Hypothesis 1**. Favourable perceptions of the regulative dimension have a positive influence on female entrepreneurial intentions	To what extent does the regulative dimension influence female entrepreneurial intentions?	IV1= Regulative dimension DV1=Entrepreneurial Intent	Questionnaire (Q6-Q9)	Ordinal Data (7 Likert Scale)	1. Hierarchical Multiple Linear Regression 2. Moderation analysis
To investigate the influence of the cognitive dimension on female entrepreneurial intentions	Shaw and Urban(2011), Urban (2013), Westhead and Solesvik (2016)	**Hypothesis 2**. Favourable perceptions of the cognitive dimension have a positive influence on female entrepreneurial intentions	To what extent does the cognitive dimension influence female entrepreneurial intentions?	IV2= Cognitive dimension DV1=Entrepreneurial Intention	Questionnaire (Q10-Q13)	Ordinal Data (7 Likert Scale)	
To Investigate the influence of the normative dimension on female entrepreneurial intentions	Shaw and Urban(2011), Urban (2013), Vossenberg (2016)	**Hypothesis 3**. Favourability perceptions of the normative dimension have a positive influence on female entrepreneurial intentions	To what extent does the normative dimension influence female entrepreneurial intentions?	IV2=Normative dimension DV1=Entrepreneurial Intent	Questionnaire (Q14-Q17)	Ordinal Data (7 Likert Scale)	
To investigate the moderating effect of the digital environment on the influence of institutional dimensions on female entrepreneurial intention	Caceres-Diaz et al.(2019) ; Zhang & Li, (2017); Dong (2018); Steiniger (2018); Susan & Ács (2017)	**Hypothesis 4**. Perceptions of the digital environment moderates the influence of institutional dimensions on female entrepreneurial intentions	Does the digital environment moderate the influence of institutional dimensions on female entrepreneurial intentions?	MV1= Digital Environment DV1=Entrepreneurial Intent	Questionnaire (Q18-Q21)	Ordinal Data (7 Likert Scale)	

APPENDIX C: Ethics 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/BA1930388/319**
PROJECT TITLE	Factors affecting entrepreneurial intentions of women in the South African digital ecosystem
INVESTIGATOR	Ms. Nombulelo Danisa
SCHOOL/DEPARTMENT OF INVESTIGATOR	MM (Digital Business)
DATE CONSIDERED	20 July 2020
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	MINIMAL RISK
EXPIRY DATE	30 JUNE 2021

ISSUE DATE OF CERTIFICATE 4 August 2020 **CHAIRPERSON** _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Dr Galawe

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.

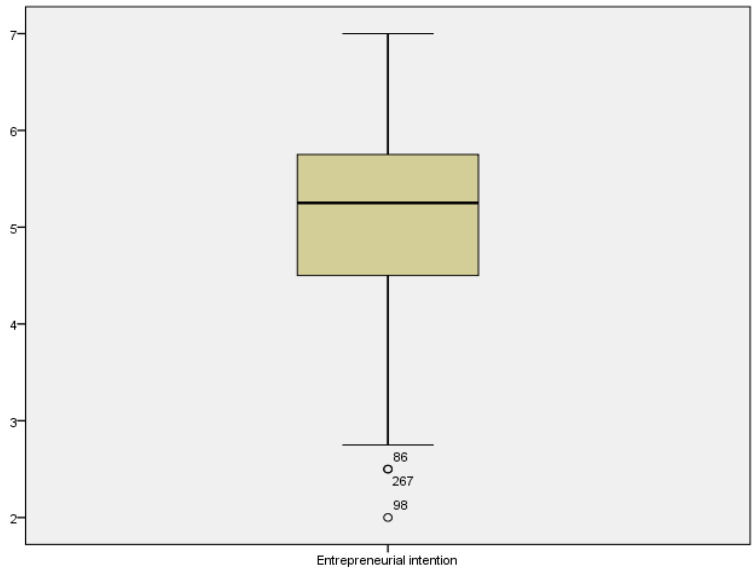
_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

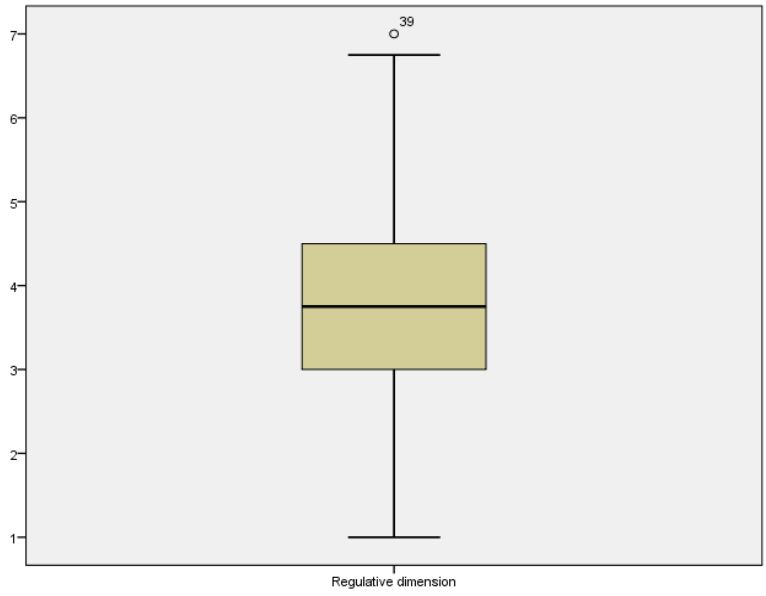
APPENDIX D: Additional Results

Test for outliers: Box and Whisker plots

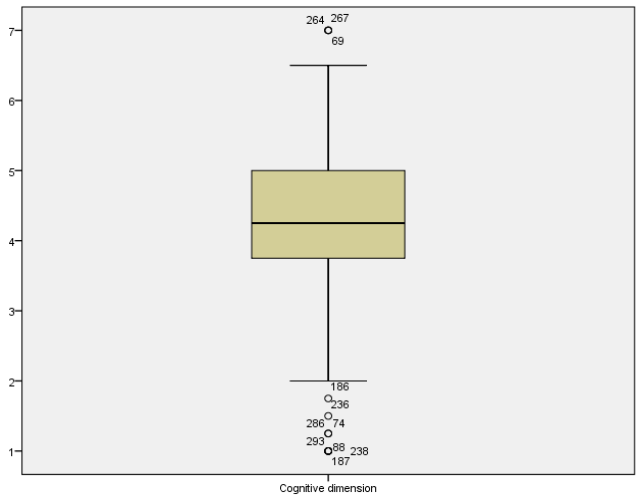
Entrepreneurial Intention



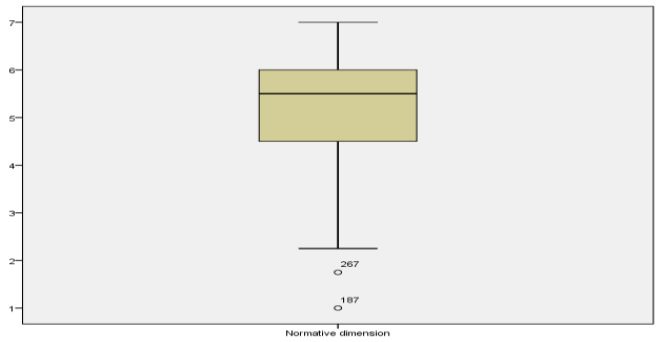
Regulative dimension



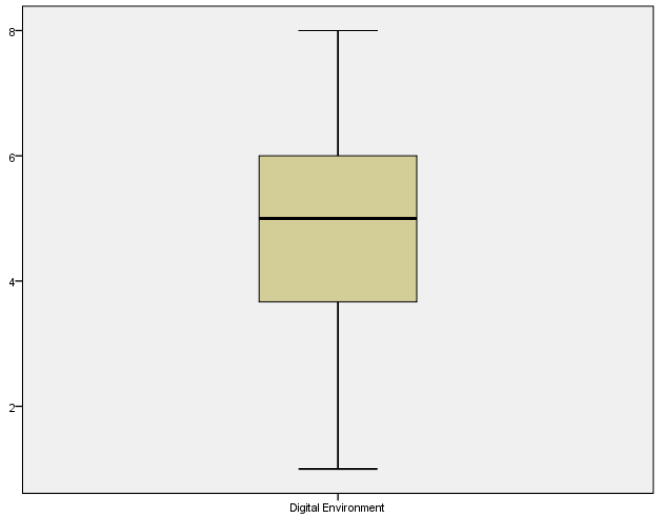
Cognitive dimension



Normative dimension



Digital environment



FACTOR ANALYSIS

Pattern Matrix

Pattern Matrix[a]

	Factor				
	1	2	3	4	5
Government assists females in starting their own business		.820			
Government sets aside contracts for new and small businesses owned by females		.836			
Even after failing, government assists entrepreneurs to start a business again		.662			
Government sponsors organizations that help new female owned businesses develop		.753			
Females know where to find markets for their products			.503		
Females find it easy to access information on how to start a business			.435		
Females who start new businesses know how to deal with risk			.918		
Females who start new businesses know how to manage risk			.847		
Turning new ideas into businesses is admired in South Africa				.801	
Innovative, creative thinking is viewed as a route to success				.629	
Female entrepreneurs are admired in this country				.650	
Females in South Africa greatly admire other females who start their own businesses				.522	

Digital knowledge is easily accessible					.870
Digital tools are easily accessible					.878
Using my mobile and social media enables me easy access to markets					.314
I am ready to do anything to be an entrepreneur	.676				
My professional goal is becoming an entrepreneur	.851				
I will make every effort to start and run my own business	.914				
I'm determined to create a business in the future	.879				
I have very seriously thought of starting a business	.871				
I have an intention to start a business some day	.852				

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Correlations

Correlations

		EI	CD	ND	RD	Digital environment
EI	Pearson Correlation	1	.170**	.131*	.058	.120*
	Sig. (2-tailed)		.003	.022	.314	.037
	N	302	302	302	302	302
CD	Pearson Correlation	.170**	1	.220**	.063	.276**
	Sig. (2-tailed)	.003		.000	.276	.000
	N	302	302	302	302	302
ND	Pearson Correlation	.131*	.220**	1	.003	.321**
	Sig. (2-tailed)	.022	.000		.957	.000
	N	302	302	302	302	302
RD	Pearson Correlation	.058	.063	.003	1	.022
	Sig. (2-tailed)	.314	.276	.957		.705
	N	302	302	302	302	302
Digital environment	Pearson Correlation	.120*	.276**	.321**	.022	1
	Sig. (2-tailed)	.037	.000	.000	.705	
	N	302	302	302	302	302

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
DE	302	3.6714	1.15540	-.075	.140	-.021	.280
CD	302	4.2980	1.11978	-.483	.140	.537	.280
ND	302	5.2028	1.10103	-.782	.140	.498	.280
RD	302	4.7448	1.64588	-.410	.140	-.689	.280
EI	302	5.1051	.97408	-.385	.140	-.245	.280
Valid N (listwise)	302						

MODERATION ANALYSIS

Regulative dimension and digital environment

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.132[a]	.018	.011	1.14907	.018	2.663	2	299	.071	
2	.145[b]	.021	.011	1.14896	.003	1.054	1	298	.305	2.222

a. Predictors: (Constant), DE, RD

b. Predictors: (Constant), DE, RD, RDDE

c. Dependent Variable: EI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.033	2	3.517	2.663	.071[b]
	Residual	394.786	299	1.320		
	Total	401.820	301			
2	Regression	8.425	3	2.808	2.127	.097[c]
	Residual	393.395	298	1.320		
	Total	401.820	301			

a. Dependent Variable: EI

b. Predictors: (Constant), DE, RD

c. Predictors: (Constant), DE, RD, RDDE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.767	.398		6.949	.000
	RD	.039	.040	.056	.968	.334
	DE	.141	.068	.119	2.073	.039
2	(Constant)	3.818	1.099		3.475	.001
	RD	-.180	.217	-.256	-.829	.408
	DE	-.062	.209	-.052	-.295	.768
	RDDE	.042	.041	.363	1.027	.305

a. Dependent Variable: EI

Cognitive dimension and digital environment

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.186[a]	.035	.028	1.13896	.035	5.375	2	299	.005	
2	.187[b]	.035	.025	1.14082	.000	.027	1	298	.870	2.186

a. Predictors: (Constant), DE, CD

b. Predictors: (Constant), DE, CD, CDDE

c. Dependent Variable: EI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.946	2	6.973	5.375	.005[b]
	Residual	387.874	299	1.297		
	Total	401.820	301			
2	Regression	13.980	3	4.660	3.581	.014[c]
	Residual	387.839	298	1.301		
	Total	401.820	301			

a. Dependent Variable: EI

b. Predictors: (Constant), DE, CD

c. Predictors: (Constant), DE, CD, CDDE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.534	.387		6.557	.000
	CD	.153	.061	.148	2.506	.013
	DE	.094	.070	.079	1.341	.181
2	(Constant)	2.340	1.246		1.877	.061
	CD	.198	.282	.192	.702	.483
	DE	.134	.256	.113	.525	.600
	CDDE	-.009	.056	-.063	-.164	.870

a. Dependent Variable: EI

Normative dimension and digital environment

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.155[a]	.024	.018	1.14524	.024	3.682	2	299	.026	
2	.190[b]	.036	.026	1.14001	.012	3.749	1	298	.054	2.200

a. Predictors: (Constant), DE, ND

b. Predictors: (Constant), DE, ND, NDDE

c. Dependent Variable: EI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.658	2	4.829	3.682	.026[b]
	Residual	392.162	299	1.312		
	Total	401.820	301			
2	Regression	14.531	3	4.844	3.727	.012[c]
	Residual	387.289	298	1.300		
	Total	401.820	301			

a. Dependent Variable: EI

b. Predictors: (Constant), DE, ND

c. Predictors: (Constant), DE, ND, NDDE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.580	.411		6.276	.000
	ND	.109	.063	.104	1.716	.087
	DE	.103	.072	.087	1.440	.151
2	(Constant)	5.297	1.461		3.624	.000
	ND	-.428	.284	-.408	-1.506	.133
	DE	-.459	.299	-.387	-1.536	.126
	NDDE	.109	.057	.809	1.936	.054

a. Dependent Variable: EI